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## ON THE ACTION OF ACID CHLORIDES ON PHENOL-ETHERS.

BY HENRY C. C. MAISCH, PH.G., PH.D.

Some years ago Friedel and Crafts (*Comptes rendues* (1877) lxxxiv 1392, 1450, lxxxv 74, etc.) described a synthetical reaction which has since then been employed in a great number of cases. The reaction is based on the following: a halogen derivative of the fatty group, in which the halogen is bound to a carbon atom, acts on benzol or its derivatives, in the presence of aluminium chloride, in such a manner that hydrochloric acid is liberated and a new body, either a hydrocarbon, a ketone or an acid derivative is formed. Until a few years ago it was thought that the reaction would only take place if one of the reacting substances were a hydrocarbon; but Leuckart and M. Schmidt (*Ber.*, xviii, (1885), p. 2338) showed this not to be the case as the hydrochloric acid addition product of phenylcyanate  $\text{Cl-CO-NHC}_6\text{H}_5$  reacts with hydrocarbons as well as with phenolethers in presence of aluminium chloride. Continuing in this line of research, Gattermann & Hess (*Liebig's Ann.* 244, p. 61), used the chloride of the simple carbonic acid  $\text{Cl-CO-NH}_2$  and obtained amides. I am greatly indebted to Prof. L. Gattermann for suggesting to me the investigation of the chlorides of the carbon acids in their effects upon the phenolethers.

These ethers were prepared according to the general method by the action of potassium hydrate in alcoholic solution on a mixture of phenol and a halogen derivative of the group to be introduced. With the naphthol ethers a simpler and cheaper method was found to answer all purposes. The latter is the action of 10 parts concentrated sulphuric acid on a solution of 25 parts of  $\alpha$ - or  $\beta$ -naphthol in 20 parts

methylic or ethylic alcohol at 135-140°C. When using methylic alcohol it is best to work under pressure to prevent loss.

*Method for the preparation of the ketones.*—To a solution of 1 part phenoether and 2 parts acid chloride<sup>1</sup> in 4 parts carbon bisulphide, 2 parts of finely powdered anhydrous aluminium chloride is gradually added. The latter is dissolved by the liquid until about one-half has been added, when a heavy oil falls to the bottom. The reaction is accompanied by a copious elimination of hydrochloric acid gas, which usually takes place without applying artificial heat; but should this not be the case, the flask is slightly warmed on a water-bath. As soon as all the aluminium chloride has been added the supernatant carbon bisulphide is poured off and, while cooling, the residue is decomposed by water. The liquid is acidified with hydrochloric acid in order to dissolve the precipitated basic aluminium compound and the ketone taken up with ether. This solution is then washed with water and a dilute alkaline solution until perfectly neutral, dried over anhydrous calcium chloride and the ether recovered. The residuary oil is subjected to fractional distillation, the colorless portion distilling above 200° C. is collected, brought into a freezing mixture and the crystalline compound subjected to pressure between absorbent paper or plates. The further purification is accomplished by crystallization from ether, dilute alcohol or glacial acetic acid.

The oxidation, by which the corresponding acids were obtained, was carried out according to the method of Weith (Ber. vii., 1874, 1057) by means of alkaline permanganate of potassium solution. By complete oxidation of the side group I obtained the carbon acids and by interrupting the action as soon as the oil drops had disappeared, the corresponding glyoxylic acids were usually obtained in such an impure state that an analysis could not be made except in a few instances. The acids were recognized by the following very characteristic reactions: 1, with active benzol and concentrated sulphuric acid (claisen); 2, by fusing with dimethylaniline and zinc chloride (malachite green).

1. Action of acetylchloride.

*Anisol* yields a body which in a pure state melts at 38-39°C. and distils at 258°C. This compound *p*-acetylanisol, crystallizes from ether in short four-sided prisms. Olivieri (*Gazetta Chimica Italiana* XIII, p. 275) obtained a body, not solidifying at -15°C. and distilling

<sup>1</sup> In the reaction with benzoylchloride the theoretical amount is best used.

between 220 and 225°C., to which he ascribed the same formula. It was probably the body here described but in a rather impure state as I found that at summer temperature it was almost impossible to obtain the acetylanisol pure.

*Phenetol*.—The acetyl-phenetol crystallizes from ether in hexagonal plates melting at 60-61°C. and distilling above 260°C.

*Resorcindiethyl ether*.—The ketone crystallizes from alcohol in small and usually pinkish crystals which melt at 67-68°C.

*a-Naphthylmethyl ether* yields a ketone, crystallizing from ether in colorless hexagonal plates which melt at 71-72°C. and distil above 300°C.

*a-Naphthylethyl ether*.—The acetyl compound crystallizes in small prisms which melt at 78-79°C. and distil above 300°C.

*β-Naphthylmethyl ether*.—The ketone crystallizes from dilute alcohol in colorless needles, melting at 57-58°C.

*β-Naphthylethyl ether*.—Yields a ketone, crystallizing from ether in colorless prisms, melting at 62-63°C., and distilling above 360°C.

2. Action of benzoyl chloride on—

*Anisol*.—The body here obtained was previously prepared in a different manner by Rennie (*Jour. Chem. Soc.*, 1882, p. 220). The crystals melt at 61-62°C., and distil above 300°C.

*Phenetol*.—The benzoyl phenetol melts at 38-39°C., and distils above 300°C.; it was crystallized from glacial acetic acid.

*a-Naphthylmethyl ether*.—The ketone here obtained melts at 74-75°C. and is decomposed by distillation.

3. Derivatives obtained from the first group:

*From acetylanisol*.—1. By action of bromine water, a monobromine substitution product, melting at 85-86°C.

2. By action of nitric acid, a body very likely belonging to the nitrosacetyls studied by Holleman (*Ber.*, xx. (1887) 3359; xxi. (1888) 2835), and melting at 139°C.

3. The ozidation product, *anisic acid*, melting at 185°C., and the corresponding glyoxylic acid in an impure state.

*From acetylphenetol*.—The oxidation product, *p*-oxethyl benzoic acid; melts at 195°C., and the allied glyoxylic acid, at 53-54°C.

*From acetyl-a-naphthylmethyl ether*.—Oxidation yielded a carbon acid, which had been previously described by Gattermann & Hess (*Lieb. Ann.*, 244, p. 61.) The corresponding glyoxylic acid was obtained in an impure state.

*From Acetyl- $\alpha$ -naphthylethyl ether.*—The carbon acid had also been prepared by Gattermann & Hess (*l. c.*)

*From Acetyl- $\beta$ -naphthylethyl ether.*—The glyoxylic acid melts at 131-136°C. under decomposition. The corresponding carbon acid could not be obtained.

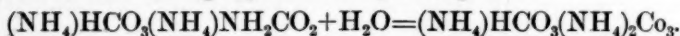
## A NOTE ON THE TITRATION OF AMMONIUM CARBONATE.

BY GEORGE M. BERINGER, PH. G.

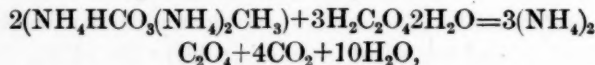
The U. S. Pharmacopœia states that "To neutralize 2.616 gm. of Carbonate of Ammonium should require 50 cc. of the volumetric solution of oxalic acid." In the Digest of Criticisms on the U. S. Pharmacopœia, page 26, occurs the following statement: "In the volumetric test an error has crept in, 50 cc. of the oxalic acid solution require '2.95' Gm. of the salt (Nat. Disp. 178). According to Squibb, 2.616 gm. require between 39 and 40°Cc. of the acid solution (Ephemeris 698)."

Having occasion recently to examine a number of samples of commercial carbonate of ammonium, my attention was attracted by the discrepancy of these statements.

The Pharmacopœia states the formula of ammonium carbonate as  $\text{NH}_4\text{HCO}_3\text{NH}_4\text{NH}_2\text{CO}_2$ . This formula, based upon the classical researches of Edward Divers, M. D., the combinations of carbonic anhydride with ammonia and water (Journ. London Chem. Soc., 1870, page 171), considers the commercial carbonate as a mixture of one molecule each of acid carbonate and carbamate, and is, I believe, the formula recognized by all the more recent text-books. Upon dissolving this salt in water, the carbamate is changed to normal carbonate; the reaction being represented by the equation



Neutralizing this by oxalic acid as in the official volumetric test, the reaction would be represented by the equation



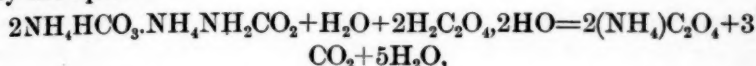
or accepting the official formula and molecular weight (157), and calculating the weights, 378 grms. of oxalic requires 314 grms. of carbonate of ammonium for saturation. Consequently 3.15 gm. oxalic acid, the amount contained in 50 cc. of the normal oxalic solu-



tion would neutralize 2.616 grms. ammonium carbonate, and the pharmacopœial requirement is *correct for the officinal salt*.

The National Dispensatory (page 177) states the salt formerly in the market was represented by the formula  $2\text{NH}_4\text{HCO}_3 \cdot \text{NH}_4\text{NH}_2\text{CO}_2$  molecular weight=236.

The reaction of such a salt with oxalic acid would be represented by the equation—



236 grm. neutralizing 252 grm. of oxalic acid. Consequently 3.15 grm. oxalic acid, the amount contained in 50 cc. of normal solution, would neutralize 2.95 grm. of a salt of this composition.

Much of the commercial carbonate of ammonium does not answer the requirements of the Pharmacopœia. Dr. Divers (loc. cit., page 240) states that he had found one exception to the uniformity of the commercial carbonate. This on analyzing gave numbers nearly identical with those of the acid carbonate. Prof. Bridges (AMER. JOUR. PHAR., 1874, page 540) likewise called attention to this salt existing in a commercial carbonate. More recently, Kraut (*Archiv d. Pharm.*, 1885, page 21) noticed the same. My own experience leads me to believe that considerable of this acid carbonate has been put on the market by an American manufacturer; perhaps unintentionally, from a desire to make a solid carbonate which would keep well. Four samples recently examined gave the following results, two determinations being made:

	Quantity taken.	Normal Oxalic Acid required.	
No. 1, American.....	2.616 grm.	35.3 cc.	34.6 cc.
No. 2, American.....	2.616 grm.	41.4 cc.	41.0 cc.
No. 3, American (Squibb's).	2.616 grm.	50.0 cc.	49.5 cc.
No. 4, English.....	2.616 grm.	49.0 cc.	48.7 cc.

Sample No. 1 was a very hard, clear salt, with but a faint odor of ammonia, and on exposing a piece to the air for several days the odor of ammonia was lost, the salt remaining nearly as translucent as before exposure. From its saturating equivalent, 2.616 grm. neutralizing 34.6 cc. normal oxalic solution, I believe it to have been nearly pure acid carbonate (2.616 grm. acid carbonate requires 33.11 normal oxalic acid solution.) Samples No. 1 and No. 2 were not free from empyremnatic substances, No. 1 having particularly a strong urine-like odor.

The volumetric estimation of carbonate of ammonia can not be accomplished by direct titration with the oxalic acid solution, owing to the decomposition of the carbonate on heating to expel the carbonic anhydride liberated. The method used by the writer was practically the same as that described by Dr. Squibb (*Ephemeris*, 698.) The sample for examination was obtained by selecting a piece of salt free from the outer white deposit of acid carbonate and making a clearance through the centre of the piece, so as to obtain a section containing the several layers. This was quickly powdered, and the desired quantity weighed and placed in a beaker with 50 cc. distilled, the beaker covered with a watch crystal or plate until the salt is dissolved and then carefully run in 55 or 60 cc. of the oxalic acid solution, raising the cover sufficiently to admit the end of the pipette. After the effervescence has ceased, warm the solution until the  $\text{CO}_2$  is entirely dispelled, and then titrate with volumetric soda solution, previously standardized with the oxalic acid solution, using the same indicator as used in the titration of the ammonium carbonate. By deducting the number of cc. of soda solution required from the number of cc. of oxalic solution used, the number of cc. of oxalic acid solution required by the ammonium carbonate is indicated. As an indicator, I prefer litmus solution, prepared by first extracting the litmus with 80 per cent. alcohol, and then dissolving in water and adding to the filtered solution a few drops of nitric acid, until the bright-blue is changed to a purplish tint.

It is apparent that much of the commercial salt is unfit for pharmaceutical purposes, although excellent in appearance. The importance of the volumetric test can not be overestimated. A definite salt answering the pharmaceutical requirements, can be obtained by resublimation and, no doubt, if the pharmacists would demand a resublimed carbonate of ammonium the manufacturers would soon meet the demand. According to Dr. Divers (loc. cit. 265) "It appears that when the normal carbonate is distilled slowly enough, the products are carbamate and water; and that when the acid carbonate is similarly distilled the product is the acid carbonate again; but that when either the normal, the acid or the half acid carbonate is distilled faster than the whole of the products of distillation can condense in the receiver, partial condensation takes place in such a way that the carbonate of commerce is formed.

OIL OF MAIZE.

BY CHARLES EDWARD BOWERS, PH. G.

Abstract from Thesis.

To extract the oil from the seed, corn was taken in the different stages of its growth to ascertain at what age it contains the largest amount of oil. The corn was carefully dried after which it was removed from the cob, reduced to a coarse powder and percolated with petroleum ether to remove the oil. The youngest specimen tried contained one per cent. of its weight of oil. The amount gradually increased with the age of the corn until the maximum was reached in that which was allowed to fully ripen and dry upon the stalks. The amount yielded by such corn was 3.16 per cent.

The oil is said to reside entirely in the embryo or germ of the corn, and to ascertain if such be the case a portion of the corn was carefully deprived of its embryo, coarsely powdered and percolated with petroleum ether, no oil was obtained. The germs on the other hand freed from all integuments and treated in the same manner yielded 22 per cent.

As obtained the oil was of a pale yellow color, and had a somewhat thicker consistence than either cottonseed or olive oils. The odor was slight but peculiar; its taste not unpleasant, bland and oleaginous; its specific gravity .917. It is a fixed oil belonging to the group of non-drying and is well adapted for lubricating purposes. It is soluble in all proportions in ether, bi-sulphide of carbon, chloroform, and benzin; very sparingly soluble in 95 per cent. alcohol, forming a milky mixture when shaken with that body which separates on standing into two layers, both of which are perfectly transparent. The oil readily saponifies with so weak an alkali as lime water, and with potassa or soda it forms a white soap. A thin layer of the oil exposed to the air for several weeks did not show any rancidity and to all appearances remained unchanged. In this respect it compares favorably with the oils of rape seed, olive, etc.

Upon strongly heating, the oil emits characteristic smoky, irritating and very disagreeable vapors, somewhat similar to those produced in the heating of cottonseed oil. It therefore would not be tolerated as an adulterant to lard, because the odor developed upon heating would certainly betray its presence. Lard itself is decomposed at high temperatures, but the odor produced is entirely distinct from that produced when oil of maize is associated with it.

It could not be used to adulterate olive oil, as it gives different results with all the tests for the identity of that body. With concentrated sulphuric acid it instantly darkens. Immersed in a freezing mixture of ice and salt, it did not deposit a granular substance and remained nearly transparent, but became very notably thicker in consistence, so much so that it was scarcely mobile. The probability is that it consists largely of olein.

It is more easily absorbed by the skin than cottonseed or olive oils, and is an excellent vehicle for external applications. It also dissolves camphor with more facility than those oils.

Numerous preparations of the Pharmacopœia were made by substituting oil of maize where cottonseed oil is directed, to ascertain whether it is capable of replacing that body. The results were very satisfactory in every case. In some instances its superiority over cottonseed oil was very well marked. In the preparation of ammonia liniment this feature was most prominent. The oil readily saponified on the addition of the ammonia water, forming a smooth, creamy mixture, which did not become curd-like or separate on standing, as is frequently the case with the officinal liniment of ammonia. Examined at the expiration of two months, no changes could be observed, and it was apparently as perfect as when first made.

The oil could be adapted to table use as a dressing for salads, etc., and could readily take the place of those oils now used for such purposes.

Taken internally in the dose of a fluidounce, it gives no medicinal effects other than those possessed by olive oil.

It is said that this oil is already an article of commerce in some of the western states. It is a by-product in the manufacture of starch. Where corn is used as the source of that substance, it becomes an object to get rid of the oil-bearing germs, and this is done by the aid of machinery, which separates the starchy portion of the corn in one direction and the germs in another. The germs are then freed from adhering integuments as far as practicable and subjected to the action of steam, after which the oil is removed by the aid of hydraulic pressure.

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**Sulfonal** is recommended for night sweats by Dr. Boethrick, a dose of 0.5 gms. (gr. vijs) being usually sufficient, and its effect being noticed during the second night in less profuse perspiration.

## GLEANINGS FROM THE GERMAN JOURNALS.

BY FRANK X. MOERK, PH. G.

*Identification of Tinctures.*—L. von Itallie has published tests of identity for the following tinctures :

*Tincture of Aloes.*—If this tincture be agitated with ether, and to the separated ethereal solution water of ammonia added, a red-violet coloration results.

*Tincture of Calumba.*—The yellowish-green residue obtained by evaporating a little of the tincture is dissolved in dilute hydrochloric acid, and if to this solution is added a small quantity of chlorine or bromine water, a light-red color is produced.

*Tincture of Cinchona.*—Two grams are precipitated by solution of lead subacetate, filtered, evaporated, the residue dissolved in water, a few drops of sulphuric acid added, and again filtered. The filtrate is tested for quinine or quinidine by the thalleioquin test.

*Tincture of Colchicum.*—Three grams are evaporated, the residue dissolved in water, the solution filtered, the filtrate agitated with chloroform, and the chloroformic solution evaporated; the residue with nitric acid, will be colored violet, changing to brown, on addition of potassium hydrate solution, becoming orange colored.

*Tincture of Digitalis.*—Five grams are evaporated, 2 cc. water added, and precipitated with a small quantity of solution of lead acetate. After filtering the filtrate is agitated with chloroform, and to the residue, after the chloroformic solution has evaporated, is added a little sulphuric acid and a few drops of bromine water; a violet coloration appears.

*Tincture of Gelsemium.*—One gram is evaporated, 1 cc. acidulated water added, filtered, the filtrate rendered alkaline with water of ammonia and shaken with chloroform. Gelsemine remains upon evaporation of the chloroformic solution, which, with sulphuric acid and potassium bichromate, yields a red-violet color. The alkaline solution (after the removal of the chloroform solution) diluted with water possesses a blue fluorescence.

*Tincture of Guaiac* is colored blue by oxidizing agents; a blue color is also obtained upon addition of cupric sulphate and bitter almond water.

*Tincture of Ipecac* is evaporated, the residue taken up with acidulated water, filtered, made alkaline with potassium hydrate solution and shaken with ether. The residue from the ethereal solution gives



a brown color, with a solution of ammonium molybdate in concentrated sulphuric acid, and upon the *immediate* addition of a drop of hydrochloric acid, a blue color soon appears.

*Tincture of Jalap* yields a residue turning red with sulphuric acid.

*Tincture of Nux Vomica* evaporated with dilute sulphuric acid gives a violet color; the residue treated with water, filtered, the filtrate made alkaline and extracted with chloroform, leaves a purified residue upon the evaporation of the chloroform, which with nitric acid is colored red, or with concentrated sulphuric acid and potassium bichromate, assumes a violet color.

*Tincture of Quebracho*, 5 grams are evaporated, the residue dissolved in acidulated water, filtered, rendered alkaline with potassium hydrate and agitated with chloroform; the chloroform residue is colored blue by sulphuric acid and potassium bichromate, or a red color is produced by boiling with dilute sulphuric acid and adding potassium chlorate. —(*Apoth. Ztg.*); *Rundschau*, 1889, 714.

*The behavior of chloral hydrate toward glass* is noticed by Ludwig Reuter in *Pharm. Centralhalle*, 1889, 477. A blue glass bottle containing chloral hydrate was sent him by a colleague; the crystals adhering to the sides of the bottle had an intense blue color. By dissolving these crystals in water and filtering, the coloring matter could be separated; the blue pigment was dissolved by chloral hydrate if the latter was melted by aid of a water-bath, but on addition of water was reprecipitated. The chloral hydrate obtained free from the coloring impurity (found to be due to traces of nickel, originally present in the smalt used in coloring the glass), answered all the requirements of the German Pharmacopœia, barring a slight residue obtained when dissolving in ether-alcohol and which residue was found to consist of formate. This mutual decomposition, so accidentally discovered, is of sufficient interest to warrant experiments made with glass of various kinds.

*Distinctive tests for Acetanilid, Methacetin and Phenacetin.*—The tests are first given and then the effect obtained by using the above substances. 1, 0.1 gm. with 1 cc. cold concentrated hydrochloric acid. 2, after observing the results of test 1, add one drop of concentrated nitric acid. 3, 0.1 gm. boiled with 1 cc. concentrated hydrochloric acid, allowed to cool, diluted with water and 3 drops of a 3 per cent. chromic acid solution added. 4, 0.1 gm. with 5-6 cc. cold concentrated hydrochloric acid and 1 cc. of the 3 per cent. chromic

acid solution. 5, 0.1 gm. boiled with 1 cc. solution of potassium hydrate, allowed to cool and 5-8 drops of  $\frac{1}{10}$  normal potassium permanganate solution added.

	I	II	III	IV	V
Methacetin.	soluble	slowly reddish brown	blood red.	immediately green.	green then yellowish brown.
Phenacetin.	insoluble.	slowly yellow.	blood red.	yellow, after a few minutes green.	dark green.
Acetanilid.	soluble, but re-precipitated.	colorless.	yellow.	yellow; only after some hours green.	dark green with disagreeable odor of carbylamin.

In this connection mention was also made of the *melting point* of *acetanilid*, commercial specimens melting at 111°, 112°, 113°, 114° and as high as 125°C. The melting point is stated by different authorities from 113° to 115°; the wide limits here recorded are produced by admixture of acetoluid.—E. Ritsert, *Pharm. Ztg.*, 1889, 546.

The color reaction for cocaine with resorcin, (see AM. JOUR. OF PHARM., 1889, 470) tried by a number of German pharmacists and chemists disclosed the fact that only one brand of cocaine hydrochlorate gave the blue color. Further investigation proved that the brand giving the test contained minute traces of nitrate as impurity, the quantity of which was so small that neither the indigo nor the ferrous sulphate test could be obtained. Instead of discovering a new reaction for cocaine salts Mr. Goeldner discovered a very sensitive

*Reaction for nitrates* carried out as follows: If to a solution of 0.01 gm. resorcin in 6-7 drops concentrated sulphuric acid be added 0.02 gm. of the substance containing a nitrate, a beautiful blue color is obtained which increases in intensity.—*Pharm. Ztg.*, 1889, 515.

*Animal and Vegetable Fats.*—The investigations of R. Benedikt and K. Hazura establish the facts that the vegetable fats always contain linoleic acid while the animal fats contain no fluid fatty acid other than oleic acid. For the physiologist these findings are interesting if not important. A practical value is also indicated, namely, the identification of commercial oleic acids as derived from vegetable or animal sources. This is possible by isolating the products of oxi-

dation with alkaline permanganate of potassium, linoleic acid giving rise to sativic acid, hence, if this latter acid is found the former acid is indicated and with it the vegetable origin. For the preparation of a pure oleic acid only animal fats as suet or lard can be used.—(*Monatsh. der Chemie*), *Chem. Rpt.*, 1889, 216.

## BALSAMODENDRON BERRYI.

BY DAVID HOOPER.

Buchanan's interesting "Journey through Mysore, Canara and Malabar" mentions (p. 8, vol. ii.) a species of myrrh about which little is known. "Many of the hedges here and in other parts of Coimbatore, are made of a thorn called *Mulukilivary*. It seems from its habits to be a *Rhus*; but not having found the fructification, I am very uncertain concerning its place in the botanical system. It makes a very good fence; cuttings three or four cubits long are put into the ground between March 12 and April 10. The ends are buried in the earth about a span, and very soon shoot out roots. From the moment it is planted it forms a fence against cattle; but seems to require a better soil than either *Euphorbium Tirucalli* or *E. Antiquorum*, which are the most common hedges here, and will grow anywhere."

The *Mulukilivary* in the above extract is the *Balsamodendron Berryi*, Arnot, and Coimbatore, the habitat of the plant, is a district lying to the south of the Nilgiri Hills. Hearing that a gum resin similar to the official myrrh could be obtained from this shrub, inquiry was made for samples and for information respecting it. The District Forest Officer of North Coimbatore forwarded me a sample of the gum-resin in October last, and furnished the following information: The gum-resin is used here by the natives medicinally. It is not collected for commercial purposes. It may be more abundantly procurable between the months of February and July. The cost of collection would come to Rs. 4 per maund (of 25 lbs.). The District Forest Officer of South Coimbatore sent me a sample rather inferior to the first, pointing out that the exudation was not used by the natives in the district in medicine or the arts, nor was it collected for commercial purposes.

The gum-resin was in pale yellow, yellowish-brown, or brown translucent fragments, tough, and breaking with a shining conchoidal

fracture. The surface had an oily appearance, and when scratched or rubbed with some hard implement showed milk-white markings. Pieces of reddish-brown bark were attached to some fragments, and others were adhering to cloth in which it had been collected. Powder was of a dirty white color, and when rubbed up with water made a thin emulsion. The odor was oily, not fragrant. Colonel Beddome alludes, however, to an aroma given off by the plant. The taste was simply mucilaginous. It dissolves for the most part in water, leaving a few flocks of soft resin and impurities undissolved.

A selected sample of the gum-resin gave to water 84 per cent. of gum; it contained 5 per cent. of moisture and 6.6 per cent. of mineral matter. The gum was gelatinized by ferric chloride, and like that from true myrrh, was not precipitated by neutral plumbic acetate. The resin was soft, transparent, tasteless, odorless and neutral in reaction. It was soluble in alcohol, ether, bisulphide of carbon and chloroform. The solution in alcohol was not colored by ferric chloride, and gave a right-handed rotation when examined with polarized light. The resin moistened with alcohol gave no color with concentrated nitric or hydrochloric acid, and no violet liquid was obtained when bromine was added to its solution in carbon bisulphide. The resin separated by alcohol and evaporated was exposed to the heat of a water bath for a week and remained soft and tenacious; after this it was exposed to the air for about two months, but its consistence was not altered, and when examined under the microscope it was seen to be perfectly amorphous.

The myrrh from the *Mulukilivary* is evidently distinct from the true myrrh, Arabian myrrh and *Bissa Bol.* Its freedom from bitterness and fragrance would render it unfit as a substitute for the genuine drug and useless as a medicinal agent. It gives off no odor when burnt, and is therefore unsuitable as an ingredient in incense. It forms a good adhesive mucilage, and might be used as a convenient addition to some kinds of confectionery. An allied species of myrrh yielding a similar exudation is the *Balsamodendron pubescens*, growing in Beluchistan, and remarkable for the large proportion of gum in the gum resin.—*Pharm. Jour. and Trans.*, Aug. 24, 1889, p. 143.

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**Antipyrin** has been successfully used as an antigalactic by Dr. Salemi (*Bull. gén. de Thérap.*). Using 0.5 gm. three times a day, the mammary secretion was diminished on the first day and ceased on the third day.

THE CULTIVATION OF MEDICINAL PLANTS IN  
CAMBRIDGESHIRE.

By E. M. HOLMES, F.L.S., Curator of the Museum of the Pharmaceutical Society of Great Britain.

Having been informed that a portion of the aconite leaves used in commerce is grown in Cambridgeshire, and being desirous of determining how far the plants grown in the same district, as well as in different counties, vary in character, I obtained permission from Mr. W. Moore, of Foxton, who is apparently the largest grower of this plant in Cambridgeshire, to examine the plant grown by him, when in blossom. On arriving at Foxton, I found that besides aconite, belladonna and henbane are also grown by Mr. Moore; only seven acres out of a large farm being devoted to these three medicinal plants, the usual proportion being about three acres each of henbane and belladonna, to one of aconite. A little foxglove is also grown. The cultivation has now been carried on at Foxton for about thirty years. The soil is apparently a mixture of chalk and gravel, with a little clay.

*Aconite*.—This is planted in rows about two feet apart, and about one foot between each plant. The fresh plantations are generally made in March soon after the leaves appear, when the young plants are divided and planted out. Mr. Moore assures me that young plants are formed on the rootlets, as represented in Bentley and Trimmen's illustration, and also at the bases of such stems as lay on the ground. This prolific formation of new roots may possibly arise from the fact that the aconite is usually cut down in the middle of June, when the flowers have begun to open, and the store of nourishment that would have gone to form seeds is probably diverted to forming roots. There does not appear to be any regular demand for aconite root of English growth, and to meet such demand as exists, a few roots are dug up in autumn, generally in October, and dried.

At the time I visited Foxton the plants were in perfection, about half of the flowers being expanded. The leaves were of a full dark green, and the flowers of a deep blue color. The helmet was not quite so semicircular as in the typical *Aconitum Napellus*, and the inflorescence showed a general tendency to branching. The whole of the plants, however, manifested a remarkable uniformity, were of very robust growth, and were flowering at the proper date, and the leaves possessed the characteristic taste of aconite. This uniformity



is due to the fact that Mr. Moore never sows the seed, but always divides the root. Indeed, the plant is cut for making extract while still in flower, and therefore before the seed is formed. Mr. Moore does not, however, make the extract himself, but sends the fresh plant, packed like faggots, to London. The aconite is usually cut overnight and sent off by an early morning train, so as to prevent as far as possible any withering by exposure to the hot sun.

Although the plant is slightly divergent from the typical *A. Napellus*, it possesses the great advantage of uniformity, and the root obtained from it would be therefore far more dependable than the foreign root either for use in medicine or for chemical analysis.

*Henbane*.—This is sown in March or in the beginning of April, and is cut about the middle of June in the next year. For drying only the flowering tops are collected, not the stem leaves, and are rapidly dried in hot air in a kiln, in which about 2 to 4 cwt. can be dried in two days. The soil does not appear so well suited for henbane as the deep rich fen land of Lincolnshire, and the plant is frequently attacked in dry seasons with a fungus which causes wrinkling and discolored spots on the leaves. Here, as elsewhere, henbane is a very uncertain crop, three out of five seasons usually failing to afford a profitable return. The plant, beside being attacked by the fungus, has its leaves riddled with a little beetle resembling the turnip flea, and in the autumn a voracious grub, apparently that of *Mamestra brassicae*, eats out the central leaf bud of the plant, so that they do not come up the second year. In the autumn the large root leaves are sometimes collected and dried, and are sold under the name of "First cutting of biennial plant," at a lower price than the flowering tops of the second year.

The variety cultivated at Foxton was obtained from wild plants found near Foxton, and has the broad leaf so characteristic of the wild henbane, as distinguished from the narrow thistle-like form cultivated in some counties. No use is made of the henbane roots, although it is hardly conceivable that they should not contain a sufficient amount of alkaloid to pay for extraction.

*Belladonna*.—This is grown from seed which is drilled in during the spring. The ground suits the plant admirably, being chalky, and although level is sufficiently porous to ensure the requisite drainage. It is, however, exposed to the full force of east winds, and hence the frosts, if late, are apt to injure it in spring, when it is about 1 ft. or

1½ ft. high. Later on it is in some seasons much attacked by green fly, which causes the leaves to pucker and wither. This generally takes place in the beginning of June.

The plant is usually sold in the green state for extract making, and the leaves are not dried. The plant is cut about the end of June. The second and third year afford the best crop of leaves, and the fourth year the roots are dug up and dried and the seed is sown in another locality. The first year after sowing, the leaves are not fit to cut, so that practically there are only three years during which the plants yield a crop.

*Fozglove.*—This is only cultivated on a small scale, as the wild plant is largely collected elsewhere for the purpose. The leaves are generally gathered in June from the biennial growth before the flowers have expanded.

In conclusion, I wish to take this opportunity of expressing my thanks to Mr. Moore for the liberal manner in which he has afforded information concerning the details of cultivation, etc., of the above-mentioned plants.—*Phar. Jour. and Trans.*, Aug. 17, p. 122.

#### MANUFACTURE OF PEEL ESSENCES.

Italy has always been the home of the orange and those of its congeners from which we derive the essences, such as lemon, bergamot and cedron, which are of so great importance in the perfumery and beverage industries. It might have been expected that the Paris Exhibition would have contained a more representative as well as a greater number of exhibits in this class than it does. But although we were somewhat disappointed on this score, we were at least pleased to note one or two exhibits of a very superior character in the Italian Court, and we were fortunate in meeting an attendant at one of them who displayed a remarkable amount of enthusiasm regarding his native industry, and who was commendably liberal in meeting our request for some information regarding his methods of working. This gentleman was Mr. C. Rizzuto, of Reggio-de-Calabre, an Italian town of 37,000 inhabitants situated opposite Messina. Mr. Rizzuto is senior partner in the firm of C. Rizzuto et Fils, whose manufactures, in conjunction with those of Francoia Genoese Labocetta, a relation, are exhibited by Pierro Merlino et Fils Cadet, of 67 Rue d'Hauteville, Paris, in the Italian Court of the Exhibition.

Mr. Rizzuto is a typical specimen of the robust Italian, grizzled by the hardships of the Garibaldian campaigns and the wars under Victor Emmanuel which gave Italy her freedom. A tough old soldier he is, bearing still the scars of wounds received when serving his country. But it is of his manufactures rather than his personality that we have to report. He tells us that the finest products are made by the old-fashioned sponge method, such as Mr. F. W. Warrick briefly described in a paper which we published last year. This method is very simple, and is used for the production of the finest essences. There are, we may state, nine different varieties or odors, lemon and bergamot being the chief. The trade names under which these varieties go are: "Bergamote," "Bergamote dorée (mûre)," "Bergamote extrait à la main," "Citron (limone)," "Citron vert (cru)," "Portugal," "Portugal muscade," "Bigarade," "Mandarine," "Limette," "Cédrin (cédrino)," and "Cédrat (cédrone)." By "à la main" is meant the sponge process, which consists simply of taking the whole fruit, dividing it into four parts, and pressing the external part of the peel against a sponge, which sucks up the essence as it is ejected from the oil sacs. Although this is a very primitive process the essences which are obtained by it are far and away the best, but the loss of essence is so great and the process so tedious that it is only applicable for those products which fetch a good price. Still, Mr. Rizzuto told us several famous perfumers will only use lemon, bergamot, etc., prepared in this way; and King Humbert, who has a liking for a single drop of "Cédrino" in his coffee, gets the à la main essence, costing 110 francs per kilo. in first hands. This flavor is also much used for ices.

For ordinary commercial purposes the essences are pressed out of the peel by means of a machine, which is entirely constructed of wood, saving the handle which turns the wheel. Contact with metal seriously affects the quality of the essence. The machine stands about 4 feet in height, and its structure is simple. The whole fruits are placed under the central circular portion, where the lower and upper surfaces are corrugated so as to press the peel unequally in order to break the oil sacs. The expressed essence is collected in a vessel below, and after settling for some time it is filtered through felt bags. Essences prepared by this method are what are known in commerce as the finest, those made by the sponge process being scarcely regarded as "commercial," their high price necessarily confining their use to those

who specially order them. But it is, of course, possible to have different qualities of the machine-made essences, as quality greatly depends upon the condition of the fruit.

There is still some doubt existing regarding the characters which true essence of bergamot ought to present. Some say it should be brownish-yellow, pale yellow (as lemon is), or green. It is the last color that druggists are most familiar with, and addressing Mr. Rizzuto on this point, we asked him what he thought about it. His reply was given in Calabrian French, and its expressiveness is lost in putting it down in cool English, but it had in it a wholesome repugnance towards much of the green essence which is in the market. Bergamot fruit, he told us, ripens in January, and at that stage the essence which it yields is golden in color, and of very fine bouquet, but much weaker, or, as Mr. Rizzuto put it, not so strong in odor as the essence made from the green fruit in November. That essence is of course green, as it is pressed from the fruit and retains the color after filtration. At this point we inspected specimens of both kinds, amongst them essences made in the 1884 and 1885 seasons, which are still fresh, odorous, and perfectly free from terebinthinate taint. Mr. Rizzuto explained that the keeping properties are entirely due to the fruit being carefully selected and equally carefully expressed. "What becomes of the spoilt fruit?" was the question which naturally followed this explanation. "It is used for making the ordinary green essence. It is done in this way." And here Mr. Rizzuto submitted a photograph of the apparatus, which consists of three parts: (1) a boiler, (2) a still, and (3) a condenser. The bergamot peel is placed in the still, which is provided with a false bottom. The boiler is for the production of steam, which is passed into the still, from the bottom of which it rises, carrying with it the essential oil, and this is duly condensed and separated from the aqueous portion. The essence so obtained is of inferior odor and is water-white. Before it can possibly be placed on the market as green bergamot it must be skillfully "doctored," both to bring up the color and the odor. Copper is the colorant. It is remarkable how easily the peel essences take up copper. Lemon becomes quite green in a day if a few chips of bright copper are immersed in it, and all the others take up the metal equally readily. Body is given to the distilled essences by adding artificial perfumes, such as the paraffin ethers, to them; and it is at this stage that sophistication sometimes takes place.

It may be useful to state here what Mr. Rizzuto considers to be the common adulterant of bergamot. First, there is the adulteration of the true expressed essence with the distilled oil. It is practically impossible to detect this admixture, as the distilled oil only reveals itself in the course of time by its terebinthinate odor. The second class of adulterants comprises rectified petroleum, turpentine, and olive oil, and which are easily detected by shaking one volume of the essence with four volumes of alcohol (S. V. R. 6, water 1), and after an hour the adulterant, if any is present, sinks to the bottom. This method is not applicable, however, to lemon and the other essences, the purity of which may be judged roughly by mixing a few drops with a morsel of sugar, and judging the odor and taste in comparison with a standard sample. One of the most lamentable features of this industry is that adulteration is not only openly practiced, but is considered to be indispensable. At first sight the reason for this does not seem to be clear, but when we keep in mind the very large number of people engaged in it, and the consequent competition, it is not so surprising. The truth is, indeed, that manufacturers have to "meet" the market. Mr. Rizzuto was careful to explain to us that his connection with the distilled oils goes only so far as their sale in the state that they are produced in by distillation. Yet the demand for "fabricated" essences he believes to be enormous. This is directly traceable to consumers, especially aerated-water makers who sell lemonade at 10d. or 1s. per dozen. Cheap essence of lemon appears to be necessary for that; yet it would be better to pay 10s. or 12s. per lb. for a pure lemon than 4s. or 5s. for an article heavily loaded with turpentine or petroleum. A little of the pure essence gives a good flavor, whereas more of a sophisticated essence destroys the lemon and imparts a foreign flavor. And what is true of beverages ought to be doubly so, if that were possible, in regard to perfumes, for after all the nose is the best analyst, the most delicate sense which we have, and anything indefinite or foreign in the components of a perfume is apt to throw the whole compound out of gear, and to destroy what might otherwise be a delicious and refreshing odor.—*The Chemist and Druggist*, Aug. 24, p. 269.

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**Uses of antifebrin.**—Salhi (*Corresp. f. Schweiz. Aerzte*) found antifebrin to act as a useful palliative in cases of sore throat and diphtheria; also in angina accompanied by high fever, the dose being 0.25 gm. three times daily.



## A NEW DETERMINATION OF THE SPECIFIC GRAVITIES OF SOLUTIONS OF AMMONIA.

BY G. LUNGE AND T. WIERNIK.<sup>1</sup>

Grüneberg (*Jour. Soc. Chem. Ind.*, 1889,390) lately published a new table of the specific gravities of solutions of ammonia which table appears to agree very closely with that published years ago by Wachsmuth. The tables of both investigators are, however, based on determinations performed at different temperatures, and if the necessary connections are introduced into Wachsmuth's tables, who took 12°C. as the normal temperature, it will be found that the agreement with Grüneberg, although still good is no longer very close. Lunge and Wiernik now made a large number of experiments, in which the specific gravities and actual percentages of ammonia in ammoniacal liquors were determined with the greatest possible care. From these determinations a table was calculated, which agrees very well with Wachsmuth's corrected for a temperature of 15°C, whereas Grüneberg's figures are a little too low, as will be seen by the comparison of the tables.

Specific Gravity.	Carius 14°C.	Grüneberg 15°C.	Smith 14°C.	Wachsmuth Corrected for 15°C.	Lunge and Wiernik 15°C.
0.880	.....	35.50	.....	35.42	35.60
0.885	35.65	33.50	.....	33.64	33.67
0.890	33.35	31.40	.....	31.86	31.73
0.895	31.10	29.50	30.4	30.08	30.03
0.900	29.00	27.70	.....	28.34	28.33
0.905	27.10	26.00	.....	26.64	26.64
0.910	25.20	24.40	24.4	25.02	24.99
0.915	23.40	22.85	.....	23.40	23.35
0.920	21.65	21.30	.....	21.80	21.75
0.925	20.00	19.80	20.3	20.26	20.18
0.930	18.40	18.35	.....	18.74	18.64
0.935	16.90	16.90	.....	17.20	17.12
0.940	15.45	15.45	15.6	15.69	15.63
0.945	14.05	14.00	.....	14.22	14.17
0.950	12.65	12.60	12.7	12.80	12.74
0.955	11.25	11.20	.....	11.35	11.32
0.960	9.90	9.80	9.8	9.98	9.91
0.965	8.55	8.40	.....	8.62	8.59
0.970	7.25	7.05	7.2	7.27	7.31
0.975	6.00	5.75	.....	5.97	6.05
0.980	4.75	4.50	4.6	4.71	4.80
0.985	3.55	3.30	.....	3.48	3.55
0.990	2.35	2.15	2.3	2.26	2.31
0.995	1.08	1.05	.....	1.17	1.14
1.000	0.00	0.00	.....	0.00	0.00

<sup>1</sup> *Zeits. f. angew. Chem.*, 1889, 181-183. Reprint from *Jour. Soc. Chem. Industry*.

Carius' table, which for a long time enjoyed a high reputation for correctness, must now give way to those of his successors, who although working independently, arrived at very nearly the same results.

The authors publish a further table, which will be found very useful.

TABLE OF THE SPECIFIC GRAVITY OF SOLUTIONS OF AMMONIA  
AT 15°C.

Sp. Gr. at 15°C.	Per cent. NH <sub>3</sub> .	One Litre contains Grammes of NH <sub>3</sub> .	Correct'n of the Sp. Gr. for 1°C.	Sp. Gr. at 15°C.	Per cent. NH <sub>3</sub> .	One Litre contains Grammes of NH <sub>3</sub> .	Correct'n of the Sp. Gr. for 1°C.
1.000	0.00	0.0	0.00018	0.940	15.63	146.9	0.00039
0.998	0.45	4.5	18	0.938	16.22	152.1	40
0.996	0.91	9.1	19	0.936	16.82	157.4	41
0.994	1.37	13.6	19	0.934	17.42	162.7	41
0.992	1.84	18.2	20	0.932	18.03	168.1	42
0.990	2.31	22.9	20	0.930	18.64	173.4	42
0.988	2.80	27.7	21	0.928	19.25	178.6	43
0.986	3.30	32.5	21	0.926	19.87	184.2	44
0.984	3.80	37.4	22	0.924	20.40	189.3	45
0.982	4.30	42.2	22	0.922	21.12	194.7	46
0.980	4.80	47.0	23	0.920	21.75	200.1	47
0.978	5.30	51.8	23	0.918	22.39	205.6	48
0.976	5.80	56.6	24	0.916	23.03	210.9	49
0.974	6.30	61.4	24	0.914	23.68	216.3	50
0.972	6.80	66.1	25	0.912	24.33	221.9	51
0.970	7.31	70.9	25	0.910	24.99	227.4	52
0.968	7.82	75.7	26	0.908	25.65	232.9	53
0.966	8.33	80.5	26	0.906	26.31	238.3	54
0.964	8.84	85.2	27	0.904	26.98	243.9	55
0.962	9.35	89.9	28	0.902	27.65	249.4	56
0.960	9.91	95.1	29	0.900	28.33	255.0	57
0.958	10.47	100.3	30	0.898	29.01	260.5	58
0.956	11.03	105.4	31	0.896	29.69	266.0	59
0.954	11.60	110.7	32	0.894	30.37	271.5	60
0.952	12.17	115.9	33	0.892	31.05	277.0	60
0.950	12.74	121.0	34	0.890	31.75	282.6	61
0.948	13.31	126.2	35	0.888	32.50	288.6	62
0.946	13.88	131.3	36	0.886	33.25	294.6	63
0.944	14.46	136.5	37	0.884	34.10	301.4	64
0.942	15.04	141.7	38	0.882	34.95	308.3	65

**Administration of Cod Liver Oil.**—The *Lyon Medical* suggests to combine cod liver oil with an equal quantity of lime water, the mixture being flavored with vanilla, lemon or other aromatic. Thus prepared it is pleasant to take, and agrees well with a delicate stomach. Similar formulas, using magnesia or potassium carbonate, are published in *AMER. JOUR. PHAR.*, 1856, p. 2.

SOLUBILITY OF GLASS IN WATER.<sup>1</sup>

BY F. MYLIUS AND F. FOERSTER.

The authors have very carefully examined the solubility in hot and cold water of a large variety of glasses of very varying composition. The glass experimented on was roughly powdered and then sifted by means of two sieves of 72 and 121 meshes respectively to the square centimeter. The portions passing through the coarser sieve, but retained by the finer, were tolerably equal in size of grain, and it was safe to assume that in equal volumes of the different glasses thus prepared the total surface was approximately equal. The minimum surfaces for the quantities taken (18 to 20 gram) was 763 square centimeters.

The results show that glass *as such* is not soluble, the solution always being accompanied by decomposition, and the ratio of the various constituents in solution is quite different to that in the original glass. The action is essentially a chemical one. For instance, in an experiment where 2.5 grams of so-called soda water-glass was treated with water and the solution separated into fractions, the result was: Original glass,  $\text{Na}_2\text{O} : \text{SiO}_2 = 34.07 : 65.93$ ; Fraction I,  $88.13 : 11.87$ ; fraction II,  $41.64 : 58.33$ ; fraction III,  $30.31 : 69.69$ ; fraction IV,  $3.1 : 96.7$ . Fraction I was obtained by the treatment of the powdered glass with cold water for five minutes; II, by washing with hot water; III, by 15 minutes' boiling; IV was the insoluble residue left.

The principal conclusions deducible from the experiments are:—

(i.) Water-glass is decomposed by water into free alkali and silicic acid, a certain proportion (varying with the time of action, concentration and temperature) of the latter becoming hydrated and dissolved.

(ii.) Potash-glasses are far less soluble than soda-glasses, but the difference decreases with increase of the proportion of lime present.

(iii.) Soda and potash are united in glass both to the silica and the lime. The resistance of glass towards the action of water is dependent on the presence of double silicates of soda or potash and lime.

(iv.) Of all sorts of glass, the plumbiferous flint-glasses are least soluble in boiling water.

(v.) The relative resistance of glasses is different towards hot and cold water.

<sup>1</sup>*Berichte*, xxii, 1092–1112; reprinted from *Jour. Chem. Soc.*, Sept., 1889, p. 828.

Tables are given in the original showing the solubility as determined by digestion with boiling water for five hours, of various glasses commonly found in commerce, and the chemical composition of the same glasses.

### MERCURAMMONIUM CHLORIDES.<sup>1</sup>

BY G. ANDRÉ.

The solutions employed contained 33·875 grams of mercuric chloride and 4.25 grams of ammonia respectively per litre, and the compounds were obtained by precipitation in the cold.

When equal volumes of the two solutions are mixed, and the precipitate is collected after several hours or days, washed with a small quantity of water, and dried at 110°, it has not exactly the composition of mercurammonium chloride,  $\text{NH}_2\text{HgCl}$ . This result is due to the decomposing action of the water, which at once becomes evident in dilute solutions, and which, as Kane has shown, results ultimately in the formation of Millon's dimercurammonium chloride,  $\text{NH}_2\text{Hg}\cdot\text{O}\cdot\text{HgCl}$ . If, however, mercuric chloride is added to an excess of ammonia and the precipitate is washed rapidly with a small quantity of water, the compound  $\text{NH}_2\text{HgCl}$  is obtained in a pure condition. The presence of Millon's compound in the precipitates formed in dilute solutions is readily detected by the fact that after these precipitates have been dried at 110°, they evolve water, if heated at a higher temperature.

With solutions of the strengths given above, the precipitate after one hour contained 0·11 mol., after 12 days 0.25 mol. of Millon's compound for each molecule of mercurammonium chloride. With 6 mols. of ammonia to each molecule of mercuric chloride, decomposition proceeds further, and the precipitate contains the two compounds in equal molecular proportions. With an increasing amount of ammonia, the precipitate eventually consists solely of the compound  $\text{NH}_2\text{Hg}\cdot\text{O}\cdot\text{HgCl}$ . Variations in the proportion of mercuric chloride have no influence on the composition of the precipitate.

If the two solutions are mixed in equal proportions, allowed to remain 24 hours, the liquid decanted off, the precipitate treated with

<sup>1</sup> *Compt. rend.*, cviii, 233, 290, 1108 and 1164; reprinted from *Jour. Chem. Soc.*, June, 1889, p. 570, and Sept., p. 827.

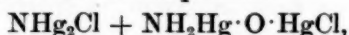
8 vols. of the ammonia solution, and this treatment repeated after a second 24 hours, the final product consists entirely of Millon's compound, whereas the original precipitate contained only 25 per cent. of it. If the solutions are mixed in equal proportions, allowed to remain 24 hours, the liquid decanted off, 4 vols. of water added to the precipitate, and this treatment repeated twice at intervals of 48 hours, the product has the composition  $\text{NH}_2\text{HgCl}, 3\text{NH}_2\cdot\text{Hg}\cdot\text{O}\cdot\text{HgCl}$ . Direct experiments with equal volumes of the solutions, and using equal volumes of water for washing, showed that the decomposing action of the water diminishes as the concentration of the ammonia increases. Ammonium chloride acts in exactly the opposite way to water. The addition of 1 vol. of the mercuric chloride solution to 5 vols. of the ammonia solution gives a precipitate which consists almost entirely of Millon's compound; but if after 24 hours the liquid is decanted off and the precipitate is treated with 2 vols. of a solution of ammonium chloride of similar strength, and allowed to remain for two days with occasional agitation the precipitate is completely converted into the compound  $\text{NH}_2\text{HgCl}$ . The proportion of ammonium chloride required to produce this result is smaller the smaller the quantity of dilute ammonia used in the precipitation. The addition of ammonium chloride without previously decanting the liquid from the precipitate has very little effect upon the latter.

If potassium hydroxide is present, so that some mercuric oxide is formed, the product contains dimercurammonium chloride,  $\text{NH}_2\text{Hg}_2\text{Cl}$ . The solutions employed contained, as a rule, one-eighth of a gram-molecule per liter. When mercuric chloride is mixed with an equal volume of potash solution and then with the same volume of ammonium chloride solution, and the precipitate, which becomes quite white, is washed and dried at  $100^\circ$ , it has the composition  $\text{NHg}_2\text{Cl}, 2\text{NH}_2\text{HgCl}, \text{NH}_2\text{Hg}\cdot\text{O}\cdot\text{HgCl}$ . If the mercuric chloride and ammonium chloride are first mixed and the potash added afterwards, the precipitate remains yellowish, and whether filtered off after a few minutes or after several hours, has the composition  $\text{NHg}_2\text{Cl}, \text{NH}_2\text{HgCl}, \text{NH}_2\text{Hg}\cdot\text{O}\cdot\text{HgCl}$ . The smaller the excess of ammonium chloride the greater the proportion of  $\text{NHg}_2\text{Cl}$ . If equal volumes of mercuric chloride and potash solution are mixed and heated to boiling for some minutes, then mixed with an equal volume of ammonium chloride and again boiled for a short time, the precipitate has the composition  $\text{NHg}_2\text{Cl}, \text{NH}_2\text{Hg}\cdot\text{O}\cdot\text{HgCl}$ , a result due to the conversion of mercurammonium chloride,



$\text{NH}_2\text{HgCl}$ , into the compound  $\text{NH}_2\text{Hg}\cdot\text{O}\cdot\text{HgCl}$  when heated with water.

Employing solutions of the same strength as in previous cases, 200 cc. of mercuric chloride solution was mixed with 150 cc. of potassium hydroxide solution and then with 100 cc. of ammonia solution, agitated for an hour and a half, filtered, washed, and dried at  $100^\circ$ . The precipitate has the composition



is not affected by boiling water, and does not alter even if heated in a current of air at  $140^\circ$  for two hours.

300 cc. of potash solution was mixed with 600 cc. of ammonia and 600 cc. of mercuric chloride was added. The precipitate was at first yellow, but soon became white. Analysis of the filtrate and the precipitate showed that the latter had the composition  $\text{NHg}_2\text{Cl} + 2\text{NH}_2\text{HgCl} + \text{NH}_2\text{Hg}\cdot\text{O}\cdot\text{HgCl}$ . If only ammonia is in excess, so that no ammonium chloride is found in the filtrate, the proportion of mercury in the precipitate becomes less, the mercurammonium chloride,  $\text{NH}_2\text{HgCl}$ , being completely decomposed. The same result is obtained whether the mercuric chloride is added to the mixture of potash and ammonia or potash is added to a mixture of the other two.

200 cc. of mercuric chloride was mixed with 400 cc. of ammonia and the precipitate washed by decantation and mixed with one molecular proportion of potassium hydroxide. After agitation for one and a half hours, the precipitate was washed and dried at  $110^\circ$ . Analysis of the filtrate and the precipitate shows that mercurammonium chloride is decomposed by potassium hydroxide, whilst at the same time it is decomposed by water with formation of Millon's salt and ammonium chloride, the composition of the precipitate being  $\text{NHg}_2\text{Cl} + 2\text{NH}_2\text{Hg}\cdot\text{O}\cdot\text{HgCl}$ .

In all these reactions, when ammonium chloride is formed mercurammonium chloride is also produced, but if ammonium chloride is not formed the precipitates contain only the compounds  $\text{NHg}_2\text{Cl}$  and  $\text{NH}_2\text{Hg}\cdot\text{O}\cdot\text{HgCl}$ . The dimercurammonium chloride is converted by excess of ammonium chloride into mercurammonium chloride.

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**Valerianic ether** has been used as a stimulant, more particularly for anæmic women subject to fainting fits. It is administered in pearls.

**Pomade for chapped hands.**—Lanolin, 100 gm.; paraffin oil, 10 gm.; vanillin, 0.1 gm.; oil of rose, 1 drop. Apply morning and evening. *Rev. Théor. Méd.*

MANGANESE OXIDES AND MANGANOUS CARBONATE.<sup>1</sup>

By A. GORGEU.

When manganous hydroxide is exposed to air in presence of an excess of a manganous salt, it yields the manganese manganite,  $2\text{MnO}, \text{MnO}_2$ , with a variable quantity of water. In presence of oxygen instead of air, oxidation is more rapid and the proportion of oxygen in the product is slightly higher. The product slowly absorbs oxygen from the air or from oxygen at the ordinary temperature, but even after 12 years the proportion of oxygen does not exceed that required by the formula  $\text{MnO}_2, \text{MnO}$ . In presence of alkalis or alkaline earths, as is well known, manganous hydroxide will take up a much larger proportion of oxygen.

Solutions of manganous salts gradually become turbid when exposed to air, especially in diffused light, and still more rapidly in bright sunlight. The change does not take place in an atmosphere of hydrogen. With the chloride, sulphate and acetate, the precipitate has the composition  $\text{MnO}, \text{MnO}_2$ , but with the nitrate, its composition is  $2\text{MnO}, 3\text{MnO}_2$ . The quantity of manganese precipitated in this form is only a small fraction of that present in the liquid. In concentrated solutions the amount precipitated is still less, and hence it would seem that precipitation is due to the action of oxygen on a manganese salt partially dissociated by water.

Solutions of manganous sulphate, nitrate, chloride, bromide and iodide may be boiled without undergoing any noteworthy alteration, but the acetate yields more precipitate than at the ordinary temperature. The precipitate has the composition  $\text{MnO}, \text{MnO}_2$ , the acetic acid is continuously given off during boiling, hence it would seem that manganous oxide is liberated in consequence of the dissociation of the salt, and behaves like the manganous hydrate thrown down by alkalis.

Iodine dissolved in a solution of potassium iodide has little action on manganous hydroxide, scarcely attacks manganous carbonate, and has no action on the acetate and salts of the strong acids. Chlorine acts rapidly on the hydroxides and on all the salts. The most concordant results were obtained with chlorine-water and manganous carbonate. With the carbonate in excess, the product was  $\text{MnO}, \text{MnO}_2$ , but with chlorine in excess the more highly oxidized products,  $\text{MnO}, 4\text{MnO}_2$  and  $\text{MnO}, 5\text{MnO}_2$ , were obtained. Up to the latter point

<sup>1</sup>*Compt. rend.*, cviii, p. 948 and 1006; reprinted from *Jour. Chem. Soc.*, Sept., 1889, p. 829.

the mixture remained neutral, and the manganous chloride formed was equivalent to the oxygen which entered into combination. The further action of chlorine is indirect, hydrochloric acid and not manganous chloride being formed.

Bromine behaves in a similar manner, but the reaction is slower.

Native manganous carbonate or *diallogite* is very stable and remains unaltered after contact with aerated water for 3 years. Precipitated manganous carbonate which has become crystalline remains in contact with aerated water at the ordinary temperature without forming any peroxide. Even at 100° the amount of peroxide formed is very minute. If the precipitated carbonate remains in contact with aerated water for 10 years, about one-third is decomposed, and the product has the composition  $MnO, MnO_2$ . Two specimens containing respectively 80 and 70 per cent. of manganous carbonate were exposed to the air in the dry state for 8 years; in the first case 33 per cent. and in the second 14 per cent. of manganous carbonate remained, the rest having been converted into the oxide  $MnO, MnO_2$ .

The oxide  $MnO, MnO_2$  can be obtained by the direct combination of manganous hydroxide and hydrated peroxide, and undergoes no change if exposed to air for 5 months in the dry state or under water.

Manganous carbonate, when exposed to the air at the ordinary temperature, yields no oxide higher than  $MnO, MnO_2$ ; but when manganous carbonate is exposed to air at 100° for 250 hours only two-thirds remains unaltered, the rest being converted into an oxide which contains considerably more oxygen than is required by the formula  $MnO, MnO_2$ . At 200°, after 30 hours, the oxide formed contains 92 per cent. of manganese peroxide. The oxide  $MnO, MnO_2$  undergoes no further oxidation at 100°.

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**Chloralamid, a new hypnotic**, was introduced by v. Mehling. It is a product of chloral anhydride ( $CCl_3CHO$ ) and formamid ( $CHONH_2$ ) and has the formula  $CCl_3CH \begin{smallmatrix} \diagup OH \\ \diagdown NHCHO \end{smallmatrix}$ . It is *chloral-formamid*, and forms colorless crystals, soluble in nine parts of water and in one and a half parts of alcohol. Its taste is mild, slightly bitter, but not biting. The watery solution keeps well; but when heated or in the presence of alkali, chloral hydrate and ammonium formate are produced. It has been given in doses of 2 to 3 grams (30 to 45 grains); sleep is usually produced in one-half to three-quarters of an hour. No unpleasant after-symptoms and no circulatory disturbances have been observed.

ACTION OF ACIDS ON THIOSULPHATES.<sup>1</sup>

BY BERTHELOT.

Thiosulphates, as is well known, are decomposed by acids with liberation of sulphurous anhydride and precipitation of sulphur. The sulphur, however, exists in different allotropic modifications, the sulphurous anhydride reacts with the liberated thiosulphuric acid before it has time to decompose, and forms thionic acids, and the latter are partially dissociated by the water. It follows that the final state of the system is a condition of equilibrium between many reactions. When a solution of sodium thiosulphate is mixed with boric acid there is no sensible thermal disturbance, and the liquid remains colorless and transparent. Acetic acid likewise produces no sensible variation of temperature, but a precipitate gradually forms and increases in quantity. The quantity of iodine absorbed is also much less than would be required if all the thiosulphurous acid were decomposed into sulphurous acid and sulphur. The thiosulphate is only decomposed to a slight extent, and it follows that the heat of neutralization of thiosulphuric acid is greater than that of acetic acid, +13.3 Cal. It is possible that an acid sodium acetate is formed, and the sulphurous anhydride which is liberated produces thionic acids by interaction with the thiosulphuric acid, and hence the great length of time required before equilibrium is established.

With sodium thiosulphate and very dilute sulphuric acid there is an immediate slight rise of temperature, followed very rapidly by the formation of a precipitate and a slight fall of temperature. The heat of neutralization of thiosulphuric acid is therefore lower than that of sulphuric acid.

Hydrochloric acid of certain concentrations produces a slight development of heat, whilst with other concentrations there is a slight absorption of heat. The liquid becomes turbid almost immediately, owing to precipitation of sulphur. It is evident that the reaction is somewhat complicated, but it is also evident that the heat of neutralization of thiosulphuric acid is practically the same as that of hydrochloric acid, and it may be taken as +13.8 Cal. without sensible error. The absorption of heat observed in some cases is due to the decomposition of the thiosulphuric acid, and is exactly equal to the difference between the heats of formation of thiosulphuric and sulphurous acids

<sup>1</sup> *Compt. rend.*, cviii, 971-978; reprinted from *Jour. Chem. Soc.*, Sept., 1889, p. 824.

respectively. The quantity of iodine absorbed by the solution after various times and under various conditions is given in the form of a table. Neglecting the complications due to the action of sulphurous anhydride on thiosulphuric acid, it seems that the decomposition of the latter begins immediately, and increases with the time and with the proportion of hydrochloric acid.

The action of sulphurous acid on sodium thiosulphate in various proportions is always exothermic, although the development of heat is but slight, and it would seem that there is a division of the base between the two acids, and interaction between those portions of the acids which remain free. When the two liquids are mixed, they become yellow and sulphur is precipitated, especially if the thiosulphate is in excess. If, on the other hand, sulphurous acid is in excess, only traces of sulphur separate, and these gradually redissolve. The quantities of iodine absorbed by the liquid indicate that decomposition is not complete, but is limited by the formation of thionic acids. The latter reaction also remains incomplete in consequence of the dissociating action of the water, and it follows that when equilibrium is established, the liquid has a very complex constitution, and contains thiosulphuric acid, sulphurous acid, sulphur, and thionic acids, the base being divided between thiosulphuric and sulphurous acids.

## EXAMINATION OF COMMERCIAL PEPTONES.<sup>1</sup>

By J. KÖNIG AND W. KISCH.

The methods hitherto in use for estimating the soluble and non-coagulable proteïds (the albuminoses and peptones) are far from satisfactory. The precipitation of the albuminoses by ferric acetate, with subsequent precipitation of the peptones by sodium phosphotungstate, yields very discordant results. The authors adopt the method of Kühne and Chittenden (*AM. JOUR. PHAR.*, 1886, p. 563), precipitation of the albuminoses with a saturated solution of ammonium sulphate, and in another portion the precipitation of both albuminose and peptone by sodium phosphotungstate, and estimation of the peptone from the difference. From 5 to 20 grams of substance (according to the proportion of water it contains) is taken. The insoluble matter and coagulable albumin are separated by filtration and by boiling, and their

<sup>1</sup>*Zeit. anal. Chem.*, xxviii, 182-201; reprinted from *Jour. Chem. Soc.*, August, 1889, p. 803.



amount determined. This is preferably effected by Kjeldahl's nitrogen process. Multiplication of the nitrogen found by 6.25 gives the amount of albumin more correctly than direct weighing. The filtrate is made up to 500 cc.; of this 50 cc. or 100 cc. is evaporated to about 10 cc., and mixed with 100 cc. of a saturated solution of ammonium sulphate in the cold. The precipitate is filtered off, washed with ammonium sulphate solution, dried and weighed, and the ammonium sulphate adhering is ascertained by a sulphuric acid determination and deducted. Of the same filtrate 50 cc. or 100 cc. is acidified with sulphuric acid, and precipitated with a strongly acid solution of sodium phosphotungstate. The precipitate is washed with dilute sulphuric acid, and the nitrogen it contains is determined. Although albuminose and peptone contain less nitrogen than albumin, the same multiplier should be used, as this will to some extent compensate for the traces of other nitrogenous substances precipitated at the same time.

Salkowski (*Berlin. Klin. Wochensch.*, 1885, No. 2), gives the following differences between albumin-peptone, gelatin and gelatin-peptone (a  $3\frac{1}{2}$ —5 per cent. solution being used).

	Albumin-peptone.	Gelatin.	Gelatin-peptone.
5 vols. of glacial acetic acid and 5 vols. of sulphuric acid mixed.....	violet	yellowish	yellowish
An equal volume of concentrated sulphuric acid in the cold.....	dark-brown	yellow	yellow
Millon's Reagent.....	reddish pp.	colorless	colorless
Solution boiled with $\frac{1}{2}$ vol. of nitric acid (1.2), then made alkaline with soda.....	deep orange	lemon-yellow	lemon-yellow

### BRITISH PHARMACEUTICAL CONFERENCE.

During the second week of September the twenty-sixth annual meeting of the British Pharmaceutical Conference was held at Newcastle-upon-Tyne. For the following abstracts of the papers read on this occasion, we are indebted to the *Pharmaceutical Journal and Transactions*, September 14.

*Tincture of Senna*.—Mr. B. S. Proctor reiterated an opinion, expressed on previous occasions, that the official tincture of senna is an inert preparation of

an active drug. In support of his position Mr. Proctor stated that alcohol is in this case an unsuitable menstruum and that, in fact, he had taken the rectified spirit extract from half an ounce of senna leaves without producing any effect; but that a draught made from the senna marc that had been already extracted with rectified spirit produced pretty strong catharsis with griping. In respect to proof spirit, Mr. Proctor said that he had taken an ounce of the official tincture of senna without any effect, and pleaded his temperance principles as a reason for not taking the quantity that would be required to produce results beyond those due to alcohol. In the discussion that followed Mr. Gerrard pointed out the desirability that the Pharmacopœia should include a greater variety in the strength of alcohol, a suggestion that was endorsed by other speakers.

*On Papain and Pepsin.*—Mr. A. Ball described the results obtained in some comparative experiments with commercial samples of papain and pepsin. From these it appeared that the papains examined by him were far inferior to the pepsins in digestive power and that in addition the peptone formed by papain was deficient in diffusive properties. Mr. Ball criticized sharply the official test requiring that two grains of pepsin should be equal to the digestion of only one hundred grains of albumen, whereas he had found that "one grain of the best pepsins in the market will digest five hundred to fifteen hundred grains when subjected to the prescribed test," and he commended "some intelligent pharmacists" who, when pepsin is ordered, dispense the pepsin guaranteed pure and free from any admixture. In the discussion that followed the pertinent question was raised as to how much albumen the pepsins for which greater activity was claimed would digest when tested strictly under B. P. conditions. But this point Mr. Ball did not appear to appreciate; at any rate the question remained unanswered.

*The Solubility of Glass.*—A paragraph that appeared in *The Month* (p. 163), relative to the coloration of some chloral hydrate by pigment derived from the bottle, gave Mr. Reynolds the opportunity for the next paper, in which he suggested that the question as to whether and how far glass bottles are soluble was one worthy of further investigation. As a contribution to the subject from personal experience, he mentioned that a solution of 1 in 10,000 of hydrochloric acid in water, which when freshly made gave a distinct reaction with congo paper, failed to do so after being kept a day in a flint glass bottle. This result he was inclined to refer to the chemical interference of the bottle with its contents. Other instances were mentioned in the discussion, and Dr. Thresh referred to an observation that a "rainfall" which when collected on litmus paper, he had found to be invariably acid, was either neutral or faintly alkaline when collected in a bottle.

*Extract of Stramonium.*—A practical note by Mr. A. W. Gerrard. It was the record of an observation, made in an emergency, that in the preparation of extract of stramonium the preliminary percolation of the seeds by ether might be omitted. He found that when the seeds were exhausted with hot proof spirit the resulting tincture yielded on evaporation a satisfactory extract containing very little fixed oil, which, if desired, could be removed by washing with a little ether.

*Ferri et Ammonii Citras.*—The next paper, by Mr. B. S. Proctor, had its origin in the observation of changes that took place in mixtures containing ferri et

ammonii citras as a constituent. For instance, one mixture consisting of forty grains of the citrate to eight ounces of water gradually became turbid, depositing a brown precipitate, and the liquid eventually becoming colorless or nearly so. When the mixture was made up with hard instead of distilled water, part of the precipitate was buff-colored and part black. At first an explanation of the instability was looked for in Mr. Umney's opinion, expressed in *The Pharmaceutical Journal* in 1873, that the official compound was deficient in ammonium citrate, and indeed a slightly better result was obtained upon the addition of a little of that salt. But that this was not a full explanation, was shown by the fact that a sample that yielded 32 per cent. of ferric oxide on incineration was more stable than one that contained only 30.7 per cent. It was then observed that the residue from an incineration gave off the odor of sulphuretted hydrogen upon the addition of hydrochloric acid, and the presence of sulphate in the original citrate was confirmed by the barium test. A suggestion that a manufacturer's modification of the official process for citrate of iron and ammonium, in precipitating the ferric hydrate with caustic soda and the use of hard water, might have introduced a trace of sulphate, was negated by the fact that a sample in the preparation of which the ferric hydrate was known to have been precipitated by ammonia, gave palpable quantities of sulphate and only traces of lime. Mr. Proctor himself refers the contamination, which in some cases equalled 2 per cent. of sulphuric anhydride, to the conditions under which the citrate is manufactured on the large scale. It is known that when ferric hydrate is precipitated from the sulphate it will contain a notable quantity of basic sulphate, unless the caustic alkali used in the precipitation is kept continually in free excess. But when a large stream of iron liquor is poured into alkali this condition is not present, since the liquid immediately surrounding the point of impact will always contain iron in excess of alkali for a sufficiently long time to allow of the formation of basic sulphate, which may escape decomposition even after the mixture becomes more complete. The remedy suggested is to allow the two solutions to mingle in thin streams so regulated that the correct equivalent proportions are pretty closely maintained. Mr. Proctor's paper also contained some interesting observations on the retardation of the precipitation of barium sulphate in the presence of a citrate.

*Easton's Syrup.*—Mr. Clague called attention to the fact that samples of Easton's syrup are sometimes met with which through the influence of a low temperature have undergone such change as to render them unfit for use. In one case the "syrup" was a jelly-like mass, with long needle-shaped crystals and tufts of crystals, and a smaller amount of fine white precipitate showing. Warmth brought about solution, but precipitation again took place on cooling to about 32° F. It was found, however, that the addition of 25 per cent. of water sufficed to maintain solution at the lower temperature, and that this was not affected upon the addition of the quinine, strychnine and ferrous phosphate requisite to bring it up to Easton's strength. The high specific gravity of the samples pointed to excess of sugar as the source of trouble, and it was ascertained that the precipitation and gelatinous appearance stood in direct relation to the quantity of sugar present. Mr. Clague therefore recommended that where Easton's syrup finds a ready use, the original formula, containing 35 per cent. of sugar, should be adhered to; but that where it is not in so frequent

demand the formula of the "Extra Pharmacopœia" should be followed, reducing the quantity of sugar (37.5 per cent.) 10 per cent. Mr. Clugne also expressed regret that there should have been introduced into the B. P. C. Unofficial Formulary a preparation bearing the same name as Easton gave to his syrup, though only containing three-fourths as much quinine phosphate. In commenting upon the paper, the President said he felt inclined to attribute the present relatively frequent occurrence of solidification in such syrups to cane sugar having been displaced in the market by beet sugar.

*Nitrous Vitriol and Aerated Waters.*—The note of Mr. Pattinson on the effect of using vitriol containing a nitrous contamination in the manufacture of certain aerated waters, although having a valuable practical application, contained nothing that had not been published before. It was to the effect that the author had traced an opalescence in a sample of ginger ale to the action of a nitrous impurity derived from the vitriol used for generating carbonic acid upon the ginger essence, the color of which it eventually discharged. The same subject was brought before the Pharmaceutical Society at an evening meeting in March, 1885 (*Pharm. Journ.*, [3], xv, 731), when Mr. Naylor recorded the much more important observation that the nitrous impurity is also capable of rapidly destroying the pungency of both ginger essence and capsaisin.

*Standardized Ipecacuanha Preparations.*—The standardization of the fluid extract and wine of ipecacuanha was the subject of the next paper read, which was the joint production of Mr. J. O. Braithwaite and Mr. J. C. Umney. For their experiments, the authors had used a root estimated to contain 1.32 per cent. of emetine, and the menstruum selected as giving the best results was rectified spirit. An extract was obtained, which estimated by a modification of Ransom's process yielded 1.28 per cent. of alkaloid. It is therefore proposed that a standard extract, prepared by a process consisting essentially of a first maceration and percolation with spirit and then after addition of slaked lime to the mark, of a second maceration and percolation with spirit, should be so adjusted in strength that 100 fluid parts should contain 1.25 parts by weight of emetine. From this it is proposed to prepare a standardized wine by dissolving one fluid part of the extract in sufficient sherry wine to produce twenty fluid parts.

*Ipecacuanha Wine.*—Finding that the modified Ransom process of assay referred to in the previous paper could be applied directly to the wine, Messrs. Braithwaite and Umney made some experiments as to the effect of the conditions obtaining in the official process for ipecacuanha wine in the amount of alkaloid present in the finished preparation. From their results they conclude that the present official process extracts practically all the alkaloid from the root, but that a considerable proportion of it is afterwards lost in the drying and powdering of the acetic extract, so that the wine produced is far inferior in relative alkaloid strength to the root from which it is prepared. They further express the opinion that the wine of the present Pharmacopœia, although a more elegant preparation than that of the B. P., 1867, is considerably inferior to it in its chief therapeutic ingredient. Samples of the preparations referred to in this and the preceding paper were shown, and the authors were strongly complimented on their contribution towards the solution of a troublesome problem.

*Assay of Ipecacuanha Wine.*—In another contribution to the literature of



ipecacuanha that followed, Mr. T. P. Blunt suggested a modification in the present method of assaying the wine for alkaloid by means of Mayer's solution. It consisted in adding a saturated solution of mercuric chloride in potassium chloride in excess to the wine previously evaporated to remove the alcohol, and then after filtering, taking the quantity of a centinormal solution of mercuric chloride that can be added to the filtrate before a permanent precipitate is produced as the measure of the quantity of mercuric chloride that has been removed from the originally saturated solution by combination with the alkaloid.

*Strychnine and Morphine Hypophosphites.*—Mr. H. W. Jones called attention to the possible value of hypophosphorous acid as a solvent of strychnine and morphine. But these alkaloids dissolve readily, according to the author, in dilute hypophosphorous acid to form solutions which can be obtained neutral, or only very faintly acid, by using a slight excess of the alkaloid. The hypophosphite of strychnine was described as a very stable salt in solution, suitable not only for hypodermic injection, but as a substitute for the hydrochlorate in the official liquor strychninæ which sometimes causes trouble in cold weather. The ready solubility of morphine in the dilute acid allows of a solution of 1 in 6, or even stronger, being easily prepared.

*On a Methyl Chloride Apparatus.*—The object of the next note, by Mr. Martindale, was to bring under the notice of the Conference a convenient little apparatus for holding chloride of methyl, which has been recently introduced into medical practice as a refrigerator. This apparatus consists of a "thermo-isolator" made of a glass test-tube fused at the top to a larger surrounding tube after the interspace has been first rendered vacuous. The vacuum acting as a non-conductor, the methyl chloride may be kept in the jacketed test-tube for some time without undergoing the volatilization which takes place almost immediately when the liquid is released from pressure under ordinary conditions. It is thus rendered accessible for saturating tampons for direct application to any part of the body and for similar purposes, when it is not desired to apply the refrigerator as a spray.

*On the Root Bark of Euonymus atropurpureus*, by Messrs. W. A. H. Naylor and E. M. Chaplin. This paper represented the useful class of work which consists in repeating the experiments of previous observers. In this instance the authors regulated their proceedings by the experiments on euonymus root bark made by Mr. W. T. Wenzell, as recorded by him in a paper published in the AMERICAN JOURNAL OF PHARMACY in 1862. They report that they have separated from the bark an unidentified crystallizable glucosidal principle, to which they have given the name "atropurpurin," Wenzell's "euonymin," citric, tartaric and malic acids, neutral fixed oil, crystalline free fatty acid or acids, an acrid and pungent principle, yellow and brown resins, bitter extractive and wax. Their results differ from Wenzell's chiefly in that instead of asparagin they obtained atropurpurin, which contains no nitrogen; besides which they got bitter extract instead of a soft resin, free fatty acid in place of crystalline resin, brown resin soluble instead of insoluble in ether, and an acrid pungent principle that Wenzell failed to detect.

*Misconceptions about Lithia.*—Mr. Siebold referred to the great faith shown by some therapeutists in the superior solvent action of lithia upon uric acid, and pointed out that this faith extends not only to the carbonate and citrate, which



are capable of acting as antacids, but also to mineral waters containing mere traces of lithium compounds and those in the form of chloride or sulphate. In a series of experiments made to ascertain how far this faith has a chemical foundation, he found that the solvent action of solutions of lithium, sodium and potassium carbonates on a given weight of uric acid, pure or as deposited from urine, or on a given weight of urinary sediment consisting of acid urates, under exactly similar conditions, is strictly proportional to the ratio of the molecular weights of these solvents. Further that lithium chloride and lithium sulphate have no solvent action on uric acid and acid urates, and lastly that the degree of alkalinity of urine produced by the internal administration of medicinal doses of lithium citrate is not greater than that produced by equivalent doses of potassium citrate.

*Arsenic in Glycerin.*—Consequent upon some statements that have been made recently, respecting the occurrence of arsenic in glycerin, Mr. Siebold's attention has been directed also to that subject, and he reported the results of the examination of a number of samples for the presence of such a contamination. The experiments were not extended to low qualities of glycerin, but were confined to colorless and odorless samples sold for toilet and pharmaceutical purposes. The majority of the samples tested proved to contain arsenious acid varying in proportion from 1 part in 4000 parts to 1 part in 6000. A few samples exceeded this proportion, and one contained as much as 1 part in 2500. Some samples that were found free from arsenic were traced all to one process of manufacture, which was described as being that by which as a rule glycerin used for dispensing purposes is understood to be made. The process followed in testing, which was demonstrated by Mr. Siebold, was a modification of one recently recommended by Vulpus and Flückiger, which depends upon the action of the gas given off by a mixture of the glycerin with zinc and very dilute hydrochloric acid in a test tube upon a paper cap that has been touched with a drop of a solution of mercuric chloride, a yellow spot being the result of the presence of minute traces of arsenic. A further observation by Mr. Siebold was consistent with arsenic being sometimes introduced into glycerin from the glass of the containing bottle, and it is proposed to further investigate this point; but there was a general agreement among the speakers that such quantities of arsenic as those found in some cases were more probably introduced during the manufacture.

*Lead in Water.*—The special object of the paper next read, by Mr. R. Reynolds, was to point out that the report of a chemical analyst on the presence or absence of lead in any particular sample of drinking water, should be so framed as to guard against it being taken to mean more than it stated. It was pointed out that the quantity of lead taken up by an acid water might vary considerably with the conditions, and that therefore the results of an analysis of a water that had been subjected to a minimum influence might have no relation to the results obtained with the same kind of water after it had been submitted to more energetic or prolonged action. This was illustrated by the results obtained in the examination of a sample of water drawn at 7 A. M., when it had probably lain in contact with the pipes for some hours, which gave 0.35 grain of lead per gallon, and one drawn three hours after, which gave only 0.1 grain per gallon. It was therefore suggested, among other ways, that relative certainty should be secured by the analyst directing that samples

of water intended for analysis should be left in contact with the ordinary service pipe for twenty-four hours.

*Strychnine Vermin Killers*—Mr. A. H. Allen gave the results of the examination of a number of samples of vermin killer obtained from different sources. These appeared to show considerable variation in the absolute and relative quantities of strychnine they contained. The principal interest of the paper lay in a suggestion as to the use of pigments for the coloration of such powders, which in those examined were ultramarine, prussian blue and carmine. Mr. Allen is of opinion that a preferable substance would be found in chrome green, or green oxide of chromium, principally on the ground of its great stability. Further, he thought arsenical fly papers should be impregnated with some soluble coloring matter, which would color water in which they are placed, and for this purpose he suggested indigo carmine, or sulfonated indigo might be used.

*On a Scale of Small Residues*—In washing precipitates or exhausting drugs by percolation it often becomes important to be able to estimate the amount of solid matter that the solvent is extracting. With a view to aiding the judgment Mr. Proctor has constructed a scale of standards for comparison consisting of the residues of the evaporation on glass slides of drops of liquid containing from one millionth to one thousandth of a grain of solid matter. The materials selected are calcium sulphate, potassium nitrate, gum acacia and gum tragacanth. The lower dilutions are made with water, but for the higher dilutions spirit is used in order to avoid vitiation of results by the fixed matter present even in distilled water.

*On Strophanthus*.—Mr. Thomas Christy gave the results of observations on various parcels of strophanthus seeds received by him since 1878, and of plants grown from some of them. So far as could be gathered his opinion coincides with that already expressed by Professor Fraser, that seeds received under the name "kombé," although differing in some minor respects from "*hispidus*" seeds, are like them referable to *Strophanthus hispidus*. The seeds of "*Strophanthus glabrus* of Gaboon" were stated to yield a "crystallizable alkaloid," but if this be correct it will be apparent from Professor Fraser's results that they differ in this respect from the seeds of *S. hispidus*. Another variety of seeds was referred to under the name *Strophanthus minor* (B), "very small in size, blunt at one end and having a spike at the other," thought to be suggestive of the appellation "turtlestrophanthus," which appears to have contained little active principle. A number of specimens were shown to illustrate the great diversity in leaf presented by plants grown from seeds received in the same parcel.

*On Strophanthus*.—The next paper read may be looked upon as one of the most important—as it was certainly the most elaborate—brought under the notice of the Conference at the Newcastle meeting. It consisted of a résumé of recent work done by Dr. T. R. Fraser upon the chemistry of strophanthus seeds, and appeared to be a continuation or development of the paper read by him before the Royal Society of Edinburgh a few months since and reported in *The Pharmaceutical Journal* (Feb. 16, p. 660), in which he dealt principally with the botany of this new and important drug. In the present paper the results obtained by treatment of the triturated dried seeds with petroleum ether, ethylic ether, water and rectified spirit, are recorded, but for the purposes of this note detailed reference need only be made to the alcoholic extract, since it

contained the whole of the active principle, strophanthin. An alcoholic extract obtained after removal of fat by ether amounted to 8.94 per cent. of the original weight of the seeds and it was estimated to consist of 63.367 per cent. of pure strophanthin, 16.275 per cent. of mucilage and 14.542 per cent. of resin. The extract was the product of three successive percolations, the first with 10 parts of rectified spirit and the other two with 5 parts each. It was found that the first percolation removed 7.9 per cent. of the 8.94 per cent. of extract obtained, and that it was very much richer in strophanthin than the products of the succeeding percolations, nearly all the active principle being extracted by the ten parts of spirit and in a more satisfactory state than in the latter portions of the extract. Further experiments showed that most of the coloring matter, resin and mucilage is derived from the testa and most of the strophanthin and oil from the cotyledons and embryos. Treatment of the dry extract as well as of an aqueous solution with reagents failed to indicate the presence of an alkaloid, but the reduction of Fehling's solution by solutions of the extract in dilute acids gave evidence of a glucoside. This action was satisfactorily connected with a substance that appeared in well-formed crystals during the evaporation of non-acidulated watery solutions of the extract, and which was identified as the active principle strophanthin. In fact it was found that strophanthin is readily decomposed by weak solutions of acids, yielding glucose and a body that has been named "strophanthidin," which crystallizes so readily that it is thought that its production in an extract by treatment with an acid might be taken as an indication of the amount of active principle originally contained therein. Strophanthin is difficult to separate; but it was obtained pure by a somewhat tedious process depending upon the formation of a tannic acid compound and subsequent decomposition by lead oxide, and it yielded upon analysis results corresponding with the formula  $C_{16}H_{26}O_8$ . Strophanthidin, the product of decomposition of the glucoside, is described as having an intensely bitter taste and a neutral reaction, and as being very slightly soluble in water, moderately soluble in cold and freely in warm rectified spirit. It is extremely active as a pharmacological agent, with symptoms closely resembling those of strophanthin. Strophanthin was also found to be present in the comose appendages and the seeds, the pericarp of the follicles, the leaves, branches, stem and root. No alkaloid was detected, but in the lead precipitate from an aqueous solution of the alcoholic extract a compound was found, of strongly acid reaction and freely soluble in water, to which the name of "komic acid" has been given.

*On Narceine.*—Recent statements as to the extent to which commercial narceine is affected in its therapeutic action by contamination with other alkaloids, together with the paper by Merck on chemically pure narceine, seem to have constituted the *raison d'être* of the next paper, by Mr. Dott, on Narceine and its Salts. Mr. Dott is of opinion that considering the facility with which narceine can be separated from morphine and codeine it is highly improbable that any manufacturer would send out the alkaloid so contaminated; but even supposing that some morphine and codeine were present in the narceine it is difficult to conceive how they would affect its action. With respect to Merck's paper, Mr. Dott points out also that the tenacity with which narceine retains hydrochloric acid had been previously recorded by Dr. Wright, who obtained pure narceine from the basic hydrochloride by converting it first into sulphate.

As to the nature of the basic hydrochloride, Mr. Dott does not think it to be a mixture or compound of the normal hydrochloride with the alkaloid, but that in it so many molecules of alkaloid are loosely combined with so many molecules of hydrochloric acid, after the manner of the relation of water of crystallization to a salt molecule.

*Lemon Juice.*—The official standard of the citricity of lemon juice was the subject of the next paper, in which Mr. T. Howell Williams expressed the opinion that this is now fixed much too high. In the B.P., 1867, the specific gravity was stated as 1.039 and the contents of a fluidounce in citric acid as 32.5 grains; in the B.P., 1885, the specific gravity is given as 1.035 to 1.045 and the citric acid as 36 grains to 46 grains to the fluidounce. In Mr. Williams' opinion, 30 to 36 grains of citric acid in the ounce would more correctly represent the amount present in the lemon juice as commonly obtained from the finest imported fruit during the winter months, and from 20 to 30 grains when the juice is pressed in summer and autumn. In support of this opinion he quoted some memoranda from the laboratory books of his firm.

*Tannin: its Solubilities, etc.*—Mr. B. S. Proctor recorded a very large number of experiments, undertaken with a view to get an explanation of the somewhat anomalous behaviour of tannin towards ether. According to the B.P., tannic acid is only sparingly soluble in ether, but Mr. Proctor confirms some previous observers in the statement that ether is really capable of forming a solution with a relatively large quantity of that compound. What appears to happen when commercial tannin is added to methylated ether is that after a time two ethereal layers are formed, one heavy and turbid, and the other light and clear, and that with successive additions of tannin the lower stratum increases in bulk and the upper one decreases and finally disappears. In one experiment this point was reached when 180 grains of tannin had been added to about 235 grains of ether, and the liquid then yielded on filtration a very small quantity of insoluble matter and was still unsaturated. The experiments were varied in many ways, involving higher rectification of the ether and drying of the tannin, but the nature of the solution, whether one of ether in tannin or tannin in ether, or whether an etherate is formed, cannot yet be said to be demonstrated. The solubilities of tannin in water, alcohol, and other menstrua, were also given.

*Wild Cherry Bark.*—The next paper, by Mr. L. W. Hawkins, dealt with the subject of the amount of hydrocyanic acid occurring in wild cherry bark and the proportion of this which finds its way into pharmaceutical preparations of the bark. Six samples of bark from leading houses, examined by distilling the finely powdered drug with water and titrating the distillate with centinormal silver nitrate solution, gave results corresponding to a yield of hydrocyanic acid ranging from 0.079 per cent. to 0.160 per cent. The preparations in use are the liquid extract, infusion and syrup of the U.S.P. and the tincture of the B.P.C. Formulary. Commercial specimens of the liquid extract, which is supposed to represent its weight of bark, gave very poor results, the highest quantity of hydrocyanic acid in any of six samples being 0.030 grams in 100 cc., and in two cases none at all. A sample made by the author strictly according to the U.S.P. formula from a bark containing 0.137 of acid only contained in the finished product 0.084 per cent., apparently showing that the portion of the menstruum not subjected to the influence of heat is insufficient to extract the



whole of this constituent. Commercial samples of the infusion and syrup also gave results considerably below the theoretical quantity, supposing that they were made from average quality bark, although it was demonstrated that a much nearer approximation could be obtained by following the U.S.P. processes. A similar remark applies to commercial samples of the *tinctura pruni virginianæ* B.P.C. The author, therefore, drew the conclusions that preparations of wild cherry bark do not, as a rule, represent the full value of the drug, so far as hydrocyanic acid, its supposed active constituent, is concerned, and that this might be caused by loss of acid in keeping or insufficient care in preparation.

*Concentrated Infusion of Gentian.*—Mr. Johnston raised the old vexed question of concentrated infusions, with a view to the introduction of such preparations in the next edition of the British Pharmacopœia. In order to give a practical turn to the discussion, he suggested the following formula for a concentrated infusion of gentian :

“Take of—

Bitter orange peel, bruised.....	}	of each, 3 ounces.
Gentian root, bruised.....		
Fresh lemon peel.....		6 ounces.
Rectified spirit .....		7½ fluidounces
Cold distilled water .....		15 ounces.
Bolling distilled water .....		A sufficiency.

Mix the orange peel and gentian root with the spirit and cold water, and, into the mixture contained in a suitable vessel, such as a wide-mouthed jar to which a bung can be fitted, grate the lemon peel. Macerate for seven days, stirring occasionally: strain through a press bag or piece of calico, and press out the rest of the infusion. Remacerate the marc with about twelve ounces of boiling distilled water for twelve hours, and again press. Mix the liquid obtained with the previous portions, and set aside for a few days, afterwards filtering and making up with distilled water to a pint and a half.”

In respect to the lemon peel, it was recommended that the yellow portion should be grated from previously weighed lemons (about six will be required) directly into the liquor, and as much of the spongy part as may contain essential oil pared off and added also, the quantity being checked by noting the loss of weight in the lemons. Such a preparation, when mixed with seven parts of distilled water, was stated to yield a liquid exactly the same in color, aroma and bitterness as the freshly-made B.P. infusion. Recognizing the possibility of an objection that the formula would yield a weak tincture rather than an infusion, Mr. Johnston thought this would be hypercritical, and suggested that where the physician wanted to avoid even this quantity of alcohol he might order “inf. gent. co. recent.” It was admitted, however, that all the infusions might not be so easily represented by concentrated preparations.

*Tincture of Lemons.*—As a sequence to the previous paper, Mr. Johnston sent a note suggesting a modification in the official formulæ for the tincture of lemon and tincture of fresh orange peel, which consisted practically in adopting the method proposed for grating the peel.

*On Official One per cent. Solutions.*—In a paper read at an evening meeting of the Pharmaceutical Society in Edinburgh last year, Mr. Macpherson criticized the formulæ given in the British Pharmacopœia for what are known as the 1 per cent. solutions, on the ground that they do not yield preparations in accordance with their reputed strength. The strychnine solution especially was sin-



gled out as one in which the proportional parts formula differs from that in which imperial weights and measures are used, and an amended formula was given by which it was claimed that a true 1 per cent. solution could be obtained whether the imperial weights and measures or the proportional quantities were used. Following up a suggestion made by Dr. Attfield, Mr. Macpherson has since extended his work and now presented a series of formulæ for the other liquors constructed on the same principle. For the sake of uniformity imperial quantities for eight ounces of solution are given in each case; otherwise official data have been adhered to as far as consistent with bringing the finished products into consonance with their reputed strength.

*On Liquor Morphine Meconatis.*—Following up his work on the official liquors still further, Mr. Macpherson proposed in another note that solution of meconate of morphine should be brought into uniformity with the other alkaloidal solutions, and made to contain one per cent. of meconate of morphine instead of about  $1\frac{1}{4}$  per cent. of the "bimeconate," as stated in the present official formula. For this purpose he has contrived two formulæ, one starting with morphine meconate and the other with morphine hydrate. Mr. Macpherson also proposes that the name of the preparation should be changed to "Liquor Morphine Meconatis," as being more correct than the present official one, the "bimeconate" having been shown by Dott in his Journal to be a hypothetical compound.

*Strength of Prussic Acid.*—In view of the fact that solutions supplied as Scheele's prussic acid are known to vary in strength, Mr. Wright's report on the strength of some commercial samples examined by him serves a useful purpose. It appeared that the range in twelve commercial samples was between 3.6 and 5.7 per cent. of HCl, or a difference of no less than 2.1 per cent. Mr. Wright suggests that the Formulary Committee might do something towards securing more uniformity in the strength of this potent agent.

*Menstrua for Aconite and Belladonna.*—With a view to ascertaining whether chloroform presents any advantages over alcohol in the extraction of aconite and belladonna, as suggested in Squire's "Companion," Mr. Wright made a series of experiments using alcohol, chloroform and mixtures of alcohol and chloroform in different proportions as menstrua. With belladonna the best results were obtained with a mixture of four parts of alcohol and one of chloroform, 20 cc. of a tincture made by maceration and percolation of 50 grams of the powdered root with sufficient menstruum to produce 100 cc. containing 40 milligrams of alkaloid, against 30 milligrams contained in the same quantity of a rectified spirit tincture, and 11 milligrams in a chloroform tincture. In the case of aconite the best results were obtained with a mixture of three volumes of alcohol and one of chloroform, 20 cc. containing 76 milligrams of alkaloid against 66 milligrams in the alcoholic tincture and 34 milligrams in the chloroform tincture.

*Sodium Salicylate.*—A third note by Mr. Wright related to an impurity observed in a sample of commercial sodium salicylate, which was not easily and completely soluble in cold water. An examination of the insoluble residue left no doubt that it consisted of salicylic acid.

*On Cascaria Esculenta.*—The last paper read was a contribution from India, being an account, by Dr. Mootoswamy, of Tanjore, of a drug said to be coming into use as a remedy for chronic enlargement of the liver, hepatic ob-

structions, piles and diabetes. It consists of the root of *Cascaria esculenta*, bearing a native name owing its origin to a "supposed property of drying up the sea." According to an analysis by Mr. D. Hooper the root contains 3 per cent. of neutral resins soluble in ether and partly soluble in spirit, an organic acid having the characters of cathartic acid, and about 10 per cent. of a tannin giving a green color with ferric chloride, which, however, does not prevent the drug from acting as an aperient.

The officers elected are: President, C. Umney, F. I. C., F. C. S.; Vice-Presidents, M. Carteighe, F. I. S., F. C. S.; L. Plowman, F. R. C. S., A. Kinninmont, W. Smeeton; Treasurer, W. Martindale, F. C. S.; Hon. General Secretaries, W. A. Naylor, F. I. C., F. C. S., and J. C. Thresh, D. Sc., M. B.; Local Secretary, F. W. Branson. Next year the Conference will meet in Leeds.

## PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

The Georgia Pharmaceutical Association held its 14th annual meeting July 23d and 24th, President W. S. Parks in the chair. The papers read were on counter prescribing, therapeutic use of antipyrin, new preparations for the pharmacopœia, percolation, and preparation of fluid extracts. T. A. Cheatham, Ph. G., Macon, was elected President; H. R. Slack, Jr., Ph. G., La Grange, secretary, and H. M. Taylor, Macon, Ph. G., treasurer. The next meeting will be held in Macon, April 15th, 1890.

The Illinois Pharmaceutical Association met August 10th in Quincy at its tenth annual meeting, President Henry Smith presiding. Papers were read on the manufacture of glucose and grapesugar, by Mr. A. E. Ebert, and on the status of pharmacy, by Mr. C. S. Hallberg and H. C. Martin. The president for the ensuing year is Hermann Schroeder, Quincy; secretary, H. C. Martin, Chicago, and treasurer, D. J. Dyson, Bloomington. The next meeting will take place at Kankakee, on the second Tuesday of August, 1890, with Mr. Freese as local secretary.

The Indiana Pharmaceutical Association convened at its eighth annual meeting in Indianapolis, June 4th; Prof. A. L. Green presided. The papers read were on emulsions, the use of the metric system, commercial pancreatin, liquor pancreaticus, quinine sulphate and thymol. Albert Allen, Greencastle, was elected president; J. A. Perry, Indianapolis, secretary, and H. C. Pomeroy, Indianapolis, treasurer. Maxinkuckee will be the place of the next meeting.

The Iowa Pharmaceutical Association assembled at its tenth annual meeting at Dubuque, June 5th; President R. W. Crawford in the chair. The topics discussed in the papers were trade interests; patent medicines; night clerks; commercial C. P. acids; and sodium sulphate, etc. W. H. Torbert, Dubuque, was elected president; Dr. Rosa Upson, Marshalltown, secretary, and J. B. Webb, De Witt, treasurer. The executive committee will select the day when the next meeting will be held at Des Moines.

The Massachusetts State Pharmaceutical Association convened its eighth annual meeting in New Bedford, September 10th; President B. F. Stacey in the chair. The chief topics of discussion were, the license question and the interchange

of certificates of registration by state boards of pharmacy; the latter measure is favored by the Association. An attempt will be made to have future exhibitions less burdened with fancy and similar articles, and to make them more practical and instructive. L. M. Snow, Fairhaven was elected president; J. W. Colcord, Lynn, secretary, and J. B. Nichols, Salem, treasurer. The date of the next meeting, to be held at Haverhill, will be announced hereafter.

*The Minnesota State Pharmaceutical Association.*—The fifth annual meeting was held in St. Paul, June 11. Perhaps the most important business transacted was the consideration of the establishment of a School of Pharmacy in the State University. The project was endorsed by the Association with the understanding that the school should be entirely independent of the medical department, and that the different branches should be taught by men fully competent for the respective positions. The Committee having the matter in charge consists of S. R. McMasters, St. Paul; J. P. Allen, St. Paul; G. A. Gottwald, St. Paul; S. W. Melendi, Minneapolis and C. L. Roos, New Ulm. E. F. Allen, Ph. G., Minneapolis, was elected president; Karl Simmon, St. Paul, secretary; and C. L. Roos, New Ulm, treasurer. Minneapolis is the place for the next meeting, to be held June 11, 1890.

*The Missouri Pharmaceutical Association* began its eleventh annual meeting at Pertle Springs, June 18, Prof. J. M. Good, presiding. Among the papers read were several on general topics and miscellaneous notes; on ammonium iodide (see p. 464); fluid extracts; fermentation of syrups; ointments; adulteration of mustard, etc. The president for the current year is C. E. Corcoran, Kansas City; secretary, G. H. Klie, St. Louis; treasurer, G. L. Meyer, St. Louis. The council will name the day when the next meeting at Excelsior Springs is to be held.

*The New York State Pharmaceutical Association* met in Binghamton, June 4, at its tenth annual meeting, Dr. R. G. Eccles, president. The association recommended for the pharmacopœia the adoption of solids by weight and liquids by measure. The interchange of certificates by state boards of pharmacy was deemed impracticable; but a national pharmacy law was favored in case a suitable one could be framed. Among the papers read was one by Prof. Bedford on pharmacopœial standards, and one by Dr. Eccles on the order of leguminosæ. Willis G. Gregory, Buffalo, was elected president; C. W. Holmes, Elmira, secretary; and C. H. Butler, Oswego, treasurer. The executive committee will fix the date of the next meeting which will be held in Auburn.

*The North Dakota Pharmaceutical Association* held its fourth annual meeting in Fargo, August 7th, President Valentine occupying the chair. The business transacted was merely of a routine nature. The Association has a membership of 160. The new executive officers are L. C. Christian, Fargo, president; H. L. Haussamen, Grafton, secretary, and E. C. Maxey, Fargo, treasurer. The next meeting will take place on the first Tuesday of August, 1890, at a place to be designated by the officers.

*The North Carolina Pharmaceutical Association* met at Durham, May 21st; T. D. Crawford, president. Besides the transaction of routine business, resolutions were passed against the continuation in pharmacopœial formulas of parts by weight; in favor of the reduction or complete repeal of the internal revenue tax on alcohol, etc. Dr. J. W. Croon, Maxton, was elected president;

E. V. Zoeller, Tarboro, secretary, and A. S. Lee, Raleigh, treasurer. Morehead City was selected as the place of the next annual meeting, the date to be named by the secretary.

The Ohio Pharmaceutical Association commenced its eleventh annual meeting in Mansfield, June 5th, President Fulton in the chair. Papers were read on glycerin by E. S. Ely and J. G. Spenser; powdered borax by Mary H. Spenser; chlorinated lime by J. G. Spenser; nux vomica by W. Simonson; uncertain medicines by Professor Lloyd. The president for the current year is L. Sherwood, Columbus; secretary, L. C. Hopp, Cleveland; treasurer, F. A. Kautz, Cincinnati. The Association will meet next year at Toledo, in the month of June.

The South Dakota Pharmaceutical Association convened at its fourth annual meeting in Aberdeen, August 20th. Papers were read on medicated waters, prescriptions, pharmacy laws, and on several commercial topics. The membership is about two hundred. R. A. Mills, Aberdeen, was chosen president; I. A. Kieth, Lake Preston, secretary, and L. T. Dunning, Sioux Falls, treasurer. The Association will meet again at Watertown, on the third Tuesday of August, 1890, E. Murphy acting as local secretary.

The Virginia Pharmaceutical Association held its eighth annual meeting at Old Point Comfort June 6, E. A. Craighill, president. Besides the usual routine business, action on the reports of officers and committees, etc., papers were presented and discussed on benzoic acid as an antiseptic; on pharmacodynamics; on commercial sodium bicarbonate; on the study of botany, and a number of practical notes contributed by several members. R. H. Stratton, Gordonsville, was elected president; C. B. Fleet, Lynchburg, secretary, and F. H. Masi, treasurer. Mr. Masi having since died, C. H. Lumsden, Lynchburg, was appointed treasurer *pro tempore*. The selection of the place and time for the next annual meeting has been entrusted to a committee, and it has been recently suggested that the meeting be held simultaneously with that of the American Pharmaceutical Association.

The Proceedings, issued in August, make a pamphlet of seventy-three pages. The membership exceeds two hundred, besides seven honorary members.

The Wisconsin Pharmaceutical Association assembled at its tenth annual meeting in Portage August 13, President J. C. Huber in the chair. The president's address, the reports of officers, committees and of the pharmacy board, were received and properly disposed of; the organization of a mutual fire insurance company was favorably considered, and a number of papers were read and discussed. W. M. Edwards, Portage, was elected president; E. B. Heimstreet, Janesville, secretary; W. P. Clarke, Milton, treasurer, and C. S. Little, Appleton, local secretary. The eleventh annual meeting will be held at Appleton on the second Tuesday of August, 1890.

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In addition to the printed proceedings previously noticed, the following have been received:

Province of Quebec.—Nineteenth annual meeting, held June 11, 1889.

Kansas.—Tenth annual meeting. Pp. 98. See p. 377.

Kentucky.—Twelfth annual meeting. Pp. 96. See p. 377.



## EDITORIAL DEPARTMENT.

*Delegates to the Pharmacopœial Convention.*—President Charles Bullock has appointed the following delegates from the Philadelphia College of Pharmacy to the Decennial Convention for the Revision of the U. S. Pharmacopœia, which will convene in Washington, D. C., in May next: Alfred B. Taylor, Ph. M., Professor John M. Maisch and Professor Joseph P. Remington.

President Emlen Painter, of the American Pharmaceutical Association, has made the following appointments for the same Convention: *Delegates*, Edward R. Squibb, M. D., Brooklyn: Albert E. Ebert, Ph. G., Chicago, and Charles Mohr, Ph. D., Mobile. *Alternates*, Alfred B. Taylor, Ph. G., Philadelphia; Carl S. N. Hallberg, Ph. G., Chicago, and Maurice W. Alexander, Ph. G., St. Louis.

*International Medical Congress.*—When, in 1887, the Ninth International Medical Congress was held in Washington, the city of Berlin was selected for holding the Tenth Congress. Notice has recently been given, over the signatures of Von Bergmann, Virchow and Waldeyer, that the Congress will convene August 4th, and close August 9th, 1890.

## REVIEWS AND BIBLIOGRAPHICAL NOTICES.

*Twenty fifth Annual Report of the Alumni Association*, with the exercises of the 63rd Commencement of the Philadelphia College of Pharmacy for the year 1888-89. 8vo. Pp. 256.

The publication contains the minutes of the Executive Board, of the social meetings and of the annual meeting; and accounts of the reception to the graduates, of the beginning of the course and of the commencement exercises, followed by obituary notices, and lists of active members, of the graduating class, &c. The pamphlet may be obtained from the secretary of the Alumni Association, Wm. E. Krewson, Ph. G.

*Pharmacographia Indica.* A history of the principal drugs of vegetable origin met with in British India. By William Dimock, Brigade Surgeon, Bombay Army, Principal Medical Storekeeper to Government; C. J. H. Warden, Surgeon-Major Bengal Army, Professor of Chemistry in the Calcutta Medical College, and David Hooper, Quinologist to the Government of Madras, Ootacamund. London: Trübner & Co. 1889. 8vo. Pp. 304.

Each one of the three authors is well known as a writer on East Indian Materia Medica, and would seem to be competent to write a graphical history of the medicinal plants of India; the three authors, by joint labor, it may be expected, will produce a work thorough and reliable in every way, and fully up to the requirements of science of the present day. Part I of the work now before us comprises only the medicinal plants of a portion of the polypetalous orders of dicotyledons, commencing with the Ranunculaceæ and closing with the Simarubæ and some of the Burseraceæ. Each article, as nearly as may be, is treated of under the following heads: Figures (giving some of the works containing illustrations of the plant); Habitat; Vernacular; History and Uses; Description; Chemical Composition; Commerce. It is scarcely necessary to state that the literature on each subject has been fully made use of, and that the authors' intimate familiarity with the drugs has enabled them to give



of each as full and detailed an account as its importance or presumed value seemed to demand. There is no doubt that the numerous remaining drugs of India will receive the same thorough attention, and we then may expect to have a standard work on Indian *Materia Medica*, and an authority on all subjects relating thereto. We look forward, with a great deal of interest, to the appearance of the remaining parts of the work, of which we shall duly apprise our readers.

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*Book on the Physician himself*, and things that concern his reputation and success. By D. W. Cathell, M.D., Baltimore, Md. Philadelphia and London: F. A. Davis, publisher. 1889. 8vo Pp. 298. Price \$2.00.

An admirable book, full of good, sensible, practical advice for the physician in his intercourse with the patient, the pharmacist, the medical profession and the general public. The keynote of the whole appears to us to be embodied in the following terse suggestions, which are equally applicable for persons busy in other spheres: "First, last, and in the midst of all, you should, as a man and as a physician, always, and above all else, keep whatever is honest, whatever is true, whatever is just, and whatever is pure, foremost in your mind, and be governed by it."

Starting from such an excellent foundation, the advice cannot be otherwise than laudable and worthy of consideration; but when, in addition to this, unbiased observation and reflection become factors, then it becomes truly acceptable. Undoubtedly there are some points in which others may differ from the views of the author; but these are expressed in such a convincing yet unobtrusive manner as to command respectful attention.

We cannot, as we should like to do, quote from the different chapters; but we cannot refrain from transcribing, at least, the beginning and closing paragraphs of Chapter X., which deals with the relations of the physician and pharmacist, to show the spirit in which the book has been written. The author says:

"Be just and friendly toward every worthy pharmacist. Owing to the close relationship and mutual dependence between pharmacy and medical practice, the pharmacists are your natural allies, and should receive your firm friendship and respect. Probably all physicians will agree that in the ranks of no profession can a greater proportion of gentlemen and manly men be found than in the pharmaceutical. This, and your joint interests, should make you brothers."

And he closes the chapter with the following:

"Bear in mind that the Sons of the Mortar and Pestle are only human, with long hours and short pay, and that they, like other persons, require some rest and relaxation from their drug-mixing and drug-selling slavery; and do not order mixtures requiring tedious manipulations, or direct filthy ointments to be mixed, or dirty plasters to be spread, suppositories to be moulded, or other unpleasant duties to be performed on Sunday, or during sleeping hours, unless they are urgently needed."

While occasionally a sketch is somewhat overdrawn—like the ten to one customers being presented at the drug store with one or two quack almanacs—the entire work makes the impression of a conscientious endeavor to weigh all possible conditions in the full light that can be thrown upon them from all

sides. This, as well as the impressive language—perhaps occasionally somewhat quaint, but always attractive—will secure for the book the earnest attention of the medical readers; and we think that pharmacists and laymen could not but read it with a clearer understanding of the duties of the true physician, the many difficulties he has to encounter, and the many obstacles he has to overcome, in his intercourse with others, and, therefore, of their own relations to the worthy practitioner.

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*Electricity in the Diseases of Women*, with special reference to the application of strong currents. By G. Betton Massey, M. D., Physician to the Nervous Department of Howard Hospital, etc. Philadelphia and London: F. A. Davis, Publisher, 1889. 12mo., pp. viii and 210. Price, \$1.50.

A portion of the introductory part of this work has been previously published in the shape of papers contributed to the *Philadelphia Medical Times*. The aim of this part is to briefly present the laws of electricity, as applied to the branch of medicine and surgery mentioned on the title page, and yet make the medical reader familiar with the apparatus and the intelligent use of the same in applying and controlling the current. The greater portion of the book speaks of the electrical treatment of the diseases of women, giving the author's observations and the experience of other prominent writers on this subject. Nearly forty illustrations are used in the text, and a well arranged index and glossary facilitate reference to special portions.

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*Universal-Pharmakopöe*. Eine vergleichende Zusammenstellung der zur Zeit in Europa und Nordamerika glütigen Pharmakopöen von Dr. Bruno Hirsch, Göttingen: Vandenhoeck & Ruprecht.

*Universal Pharmacopœia*. A comprehensive comparison of the pharmacopœias at present in force in Europe and in North America.

Referring to our previous notice of this valuable work on page 103 of the present volume, we merely state now that the fascicles 5 to 8, now before us, carry the work to No. 3032 *Syrupus Acidi tartarici*. It is, therefore, sufficiently advanced to insure its completion in a very short time.

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*Étude sur les Produits de la famille des Sapotées*. Par Louis Planchon, Docteur en Médecine, etc. Montpellier: Hamelin Frères. 1888. 8vo., pp. 121.

On the products of the order of Sapotaceæ.

An interesting monograph which, after an introduction, gives the general characters of the order, its affinities, geographical distribution, and the arrangement of the genera according to Pierre and to Bentham and Hooker. The main portion of the monograph treats of the products of the order under the following heads: milkjuices (*gutta-percha*, *balata* and *massaranduba*), woods, flowers (*mahwah*), comestible fruits (*starapple*, *sapotilla plum*, *marmelade*, etc.), and fats (*galam butter*, *fulwa butter*, etc.). In relation to medicinal uses, quite a number of species are enumerated and more or less extensively described; these medicinal plants belong to the genera, *Lucuma*, *Chrysophyllum*, *Sideroxylon*, *Argania*, *Labatia*, *Achras*, *Bassia*, *Butyrospermum* and *Mimusops*. A bibliographical table, covering six pages, gives the titles of a large number of books, and of essays referring to the subject matter of the monograph.

*Ueber die Verbreitung Chemischer Verbindungen in der Pflanzenwelt.* Von. Ed. Schär. 8vo., pp. 31.

On the distribution of chemical compounds in the vegetable kingdom.

This is a reprint from the *Swiss Weekly Journal of Pharmacy* of a lecture delivered by Professor Schaer some months ago. The subject is a very interesting, and at the same time a very important one, and is presented by the author in a very comprehensive manner. After an introduction and the consideration of widely distributed compounds (inorganic substances, carbohydrates, acids and coloring matters), the special principles receive attention, and the following groups are pointed out: alkaloids, fat acids, aromatic acids, phenols, kinones and ketones, volatile oils, special coloring matters and glucosides and bitter principles.

*La Pharmacie à Montpellier depuis son origin jusqu'à la révolution* Étude historique d'après des documents originaux. Par A. P. Marty, pharmacien de 1re classe. Montpellier: Gustave Firmin, 1889. 8vo. Pp. 115.

Pharmacy in Montpellier from its origin to the revolution. Historical study based upon original documents.

After a brief historical introduction on the origin of pharmacy the author proceeds to the local history of pharmacy in Montpellier, and quotes the oldest known document relating to it which was issued in the Latin language in 1340 and is entitled: *De visitandis apothecariis*. The chief vicissitudes of pharmacy are then described, how it became completely dependent upon the medical profession, but during the sixteenth and seventeenth centuries sought to gain its autonomy, until after having been under the supervision of the University of Medicine, it finally succeeded to gain a foothold distinct from its older sister. A powerful impulse was given to the movement by the revolution and on December 18th, 1790, apothecaries were admitted to the Public Health Commission.

*Étude sur les différents procédés employés dans la détermination de l'astigmatisme.* Par Émilien Grimal, Licencié ès-sciences physiques et chimiques, etc. Montpellier: Gustave Firmin, 1889. 8vo. Pp. 82.

On the different methods employed for the determination of astigmatism.

The methods proposed by different German, French and English physicians are described and compared, likewise the various apparatus that have been used for this purpose and which have become known as astigmatoscopes, optometers and ophthalmometers.

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## OBITUARY.

Dr. Anton Geuther, professor of chemistry at the University of Jena, died there August 25th in the fifty-seventh year of his age. He was born in Neustadt, Saxe-Coburg, graduated 1855 in Göttingen, and since 1863 labored at Jena. He was the author of a valuable "Lehrbuch" of chemistry, and of numerous papers on chemical subjects, which originally appeared in *Liebig's Annalen* and in *Berichte*, and comprise many compounds of pharmaceutical interest, like chromium compounds, various sulphites and sulphides, lead oxides, ethers, chloroform, iodoform, bitter principle of calamus, &c.

*Dr. Oscar Jacobsen*, professor of chemistry in the University of Rostock, died in that city August 24, in his fiftieth year. He was born in Holstein, became a pharmacist, serving as apprentice and assistant for nine years, in 1865 passed the State's examination and then continued the study of chemistry as Prof. Himly's assistant, receiving the decree of Phil. Dr. in 1868. Since 1873 he held the chair of chemistry in Rostock. Among his scientific labors are researches on bile, on ketones, on chlorine derivatives of ether and aldehyd, and particularly on the aromatic hydrocarbons and their derivatives, notably the sulfo acids. He contributed a number of articles to Ladenburg's Dictionary of Chemistry (*Handwörterbuch*), of which those on the alkaloids and the glycosides are perhaps the most important ones for pharmacists.

*Dr. August Vogel*, professor of agricultural chemistry in Munich, died August 14th, aged 72 years. He was the son of Prof. Dr. H. A. von Vogel, who, during the early part of the present century, was well known as a teacher of chemistry, first in Paris and afterward in Munich, and who, in 1868, died in his ninetieth year. The younger Vogel, who was born in Munich, August 4th, 1817, studied medicine, graduated in 1839, then became assistant to his father, and since 1848 belonged to the University of Munich as extraordinary professor, and since 1869 as full professor. Besides several separate works on various topics, he was the author of numerous scientific papers, which were mostly contributed to Buchner's *Repertorium*, a number of which were re-published in the AMERICAN JOURNAL OF PHARMACY previous to 1870.

*Henry J. Menninger, M. D.*, died in Brooklyn, September 8th, in the fifty-second year of his age. He was born near Mainz, Germany, and at the age of twelve years came to this country, his father, a physician, settling in New York, where Henry learned the drug business and afterwards studied medicine in the medical department of the University of New York. In 1861 he enlisted as a private, was promoted to lieutenant, was wounded on the battle-field in Virginia, and afterward became post surgeon at Newbern, N. C. After the close of the war, he was for some time editor of the *Newbern Republican*; was then elected secretary of the State of North Carolina, and after the expiration of his term of office engaged in the drug business in Raleigh. Since 1873 he has been living in New York and Brooklyn, where he carried on the drug business. In Brooklyn he was elected to the office of an alderman and of coroner, and was a trustee of the Germania Savings Bank. For about sixteen years he was a member of the New York College of Pharmacy, and most of the time one of its vice-presidents, and a member or chairman of the examining committee. In 1866 he joined the American Pharmaceutical Association; first attended the meeting of 1869, but after his removal to New York was frequently present, and served the Association on many committees, and from 1886-87 as first vice-president. Dr. Menninger was a man of clear conceptions and earnest efforts, firm in his convictions, and ready to aid by word or deed what he considered to be to the interest of the Association or his chosen profession. His expressive voice commanded attention no less than his logical thoughts; he was not only a good speaker, but also a good counsellor.

*Charles Moritz Rebner, Ph. G.*, class 1885, Philadelphia College of Pharmacy, died at his home at Atchison, Kansas, August 1st, of consumption, aged 25 years. He was a promising young man, and a favorite with his classmates.